

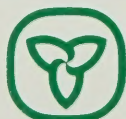
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# THE TRANSPORTATION TOMORROW SURVEY

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## AN OVERVIEW OF TRAVEL CHARACTERISTICS IN THE GREATER TORONTO AREA

FOURTH REPORT OF A SERIES



Ontario

A survey conducted for:  
the Regions of Durham, Halton, Hamilton-Wentworth, Peel and York;  
Metropolitan Toronto, Ministry of Transportation,  
GO Transit and the Toronto Transit Commission.



## **TRANSPORTATION TOMORROW SURVEY**

**A Telephone Interview Survey of Household Travel  
Behaviour in the Greater Toronto Area  
Conducted in the  
Fall of 1986**

### **AN OVERVIEW OF TRAVEL CHARACTERISTICS IN THE GREATER TORONTO AREA**

**Prepared for the  
Toronto Area Transportation Planning  
Data Collection Steering Committee**

#### **Participating Agencies:**

**GO Transit  
Metropolitan Toronto  
Ministry of Transportation, Ontario  
Regional Municipalities of Durham, Halton,  
Hamilton-Wentworth, Peel and York  
Toronto Transit Commission**


**December 1988**





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## PREFACE

This report was prepared to present an overview of the results of the Transportation Tomorrow Survey (TTS) and an indication of some of the travel characteristics and trends that are occurring in the Greater Toronto Area (GTA).

It is the fourth in a series of reports. The first report, "Design and Conduct of the Survey" (December 1987) presented the background of events leading to the survey and the technical details of the survey process. The second report, "Data Validation" (August 1988) examined the quality of the TTS data by making comparisons with other data sources. The third report, "Version 2.2 Data Guide" (August 1988) gives TTS data users a complete description of the data base.

While this report gives a broad overview of inter-regional travel throughout the GTA, other reports and bulletins will follow which will deal with travel behaviour and regional travel patterns in more detail.





## ACKNOWLEDGEMENTS

The Transportation Tomorrow Survey and its analysis to date has been a co-operative effort by nine agencies involved in regional transportation planning within the Greater Toronto Area.

This report was prepared for the Toronto Area Transportation Planning Data Collection Steering Committee and direction was given by the Transportation Research and Data Management Group.

The following members served on the Transportation Research and Data Management Group and provided valuable comments on the report:

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## 1.0 INTRODUCTION

Travel characteristics at an inter-regional level can best be determined by conducting an origin-destination travel survey. In 1986, members of the Toronto Area Transportation Planning Data Collection Steering Committee carried out such an initiative for the Greater Toronto Area called the Transportation Tomorrow Survey. This is the most comprehensive survey of travel patterns carried out in the Toronto area since a home interview survey was carried out in 1964 as part of the Metropolitan Toronto and Region Transportation Study (MTARTS). It is expected that the results of the 1986 survey will be used for transportation planning and analysis for a number of years into the future.

This report is meant as a preliminary overview of the key findings of the survey. Where possible it contains comparisons with the results of previous surveys of travel characteristics within the six Regions of the Greater Toronto Area.

## 2.0 SUMMARY

The Transportation Tomorrow Survey has indicated that a substantial increase has occurred in trip-making - it measured 8.7 million trips a day generated by residents in the Greater Toronto Area in 1986. This compares with approximately 3.7 million trips measured in 1964 by the MTARTS survey.

Trip-making has been growing at a rate considerably faster than the population growth of the area. While population has grown at an average of 1.9% per year over the past 22 years, trip-making has grown at 3.9% per year over the same period. In 1986, on the average, 2.1 trips per day were made by each person. The corresponding trip rate was 1.3 trips per person per day in 1964.

Overall trip rates are higher in the outlying Regions (ranging from 2.2. to 2.5) than they are in Metro Toronto where the trip rate is 2.0 trips per person per day.

A number of factors have helped to bring about a higher rate of trip-making. Households have become smaller (declining to 2.8 persons/household), resulting in more concentration



of trip-making activity. A prosperous economy has created new jobs, many of which have been filled by women who have entered the labour force in increasing numbers. Female participation in the labour force increased by 50 percent between 1971 and 1986, at which point it was 77 percent of the rate for males. The population has aged in such a way that the proportion of people of working age (16 to 65 years) has grown. The expanded labour force has created more demand for transportation. Auto ownership per person has doubled since 1964, a reflection of increasing affluence of the area and of a trend towards suburban auto-oriented development.

Eighty-three percent of the daily personal travel that occurs takes place within Regional boundaries. The remaining 17 percent of the travel crosses Regional boundaries. Almost two thirds of all trips have Metro Toronto as either the origin, the destination or both. Nearly half of all GTA trips take place entirely within Metro Toronto. The Regions of Peel and York have the highest trip interaction with Metro Toronto. Approximately one third of the trips by York Region residents and over one fifth of the Peel trips cross into Metro Toronto. The degree of self-containment, in terms of the proportion of

work trips that stay within Regional boundaries, is highest for Metro Toronto (87%) and for Hamilton-Wentworth (85%).

In comparing the TTS results with the earlier MTARTS survey, trip purpose has shifted very little. The dominant purposes continue to be work and school, but there has been a small increase in non-home based trips, reflecting a change in lifestyle.

Transit ridership in the GTA has been growing at a faster rate than population due primarily to the increased popularity of the services provided by the Toronto Transit Commission and GO Transit. The transit share of trip-making for all purposes combined has increased in each Region. Metro Toronto has the highest 1986 transit modal split at 25.7%. Transit modal splits for work trips to Metro Toronto have increased since 1979. Current transit modal splits for home to work trips by residents of a Region are 7 to 8 percent for Durham and Halton, 10 to 12 percent for York, Hamilton-Wentworth and Peel, and 33% for Metro Toronto.

Age and sex are both key factors in the propensity to make trips. Women, on average, are one third more likely to use transit as men, and they are one third less likely to drive

on a given day. The heaviest users of transit are teenagers and they are twice as likely to make transit trips (school bus or public transit) as are people of age 30 or older. The auto driver trip rate per person peaks strongly at about age 40 and declines rapidly as age increases. These relationships are very important factors which can be expected to affect future trip-making activity in the Greater Toronto Area in the light of changing age profiles.

The Transportation Tomorrow Survey indicates that trip-making start times peak sharply in the morning. A broader peak occurs in the afternoon and evening. There has been relatively little change in this start time distribution over the past 30 years.

Work trips and transit-based trips are the strongest contributors to the peaks which occur during the day.

The 1986 Transportation Tomorrow Survey provides a comprehensive record of daily travel throughout the Greater Toronto Area by residents. It will provide, on an ongoing basis, an improved understanding of current travel patterns and behaviour which is essential for determining future transportation requirements.

### 3.0 REGIONAL DEMOGRAPHIC DATA

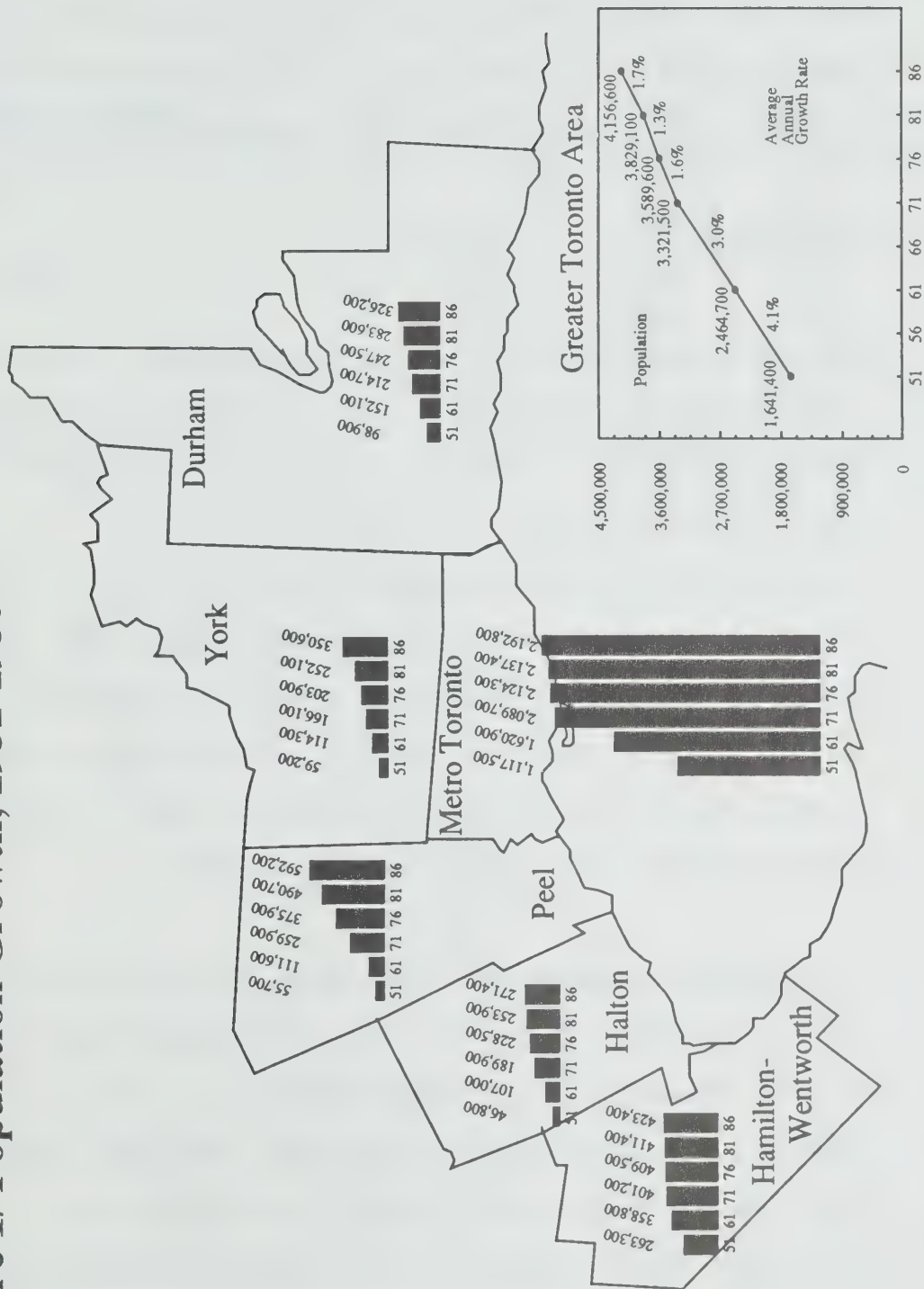
Travel patterns in an area are greatly influenced by changes in population and employment. This section reviews population growth, the effect of declining household size, the increased labour force and the growth in automobile ownership.

#### 3.1 POPULATION

Population growth for the years 1951 through to 1986 within the Regions of Durham, York, Peel, Halton, Hamilton-Wentworth, Metropolitan Toronto and the entire Greater Toronto Area is illustrated in Figure 1. These Census of Canada statistics indicate that growth has been taking place predominantly in the suburban fringes of the Greater Toronto Area. Of particular note are the Regions of York and Peel - over the last 5 years the average annual population growth rates have been 6.8 and 3.8 percent respectively. The smallest annual population growths of 0.5 and 0.6 percent have occurred in the high density urban regions of Metro Toronto and



Figure 1/ Population Growth, 1951-1986



Source: Statistics Canada, Census of Canada, 1951-1986

Hamilton-Wentworth respectively. The average population growth rate in the Greater Toronto Area has decreased from 3.6 percent per year from between 1951 and 1971 to 1.7 percent per year between 1981 and 1986.

### 3.2 HOUSEHOLDS

The number of households by geographic area, from the 1986 Census, has been used as a base for expanding the TTS data sample to represent trip-making and other characteristics of the total population. (The Transportation Survey recorded trip-making by 4.1% of all households in the Greater Toronto Area.) The total number of households in the Regions of the Greater Toronto Area is shown in Table 1. The average annual growth rate in households from 1981 to 1986 for the Greater Toronto Area was about 2.1 percent.

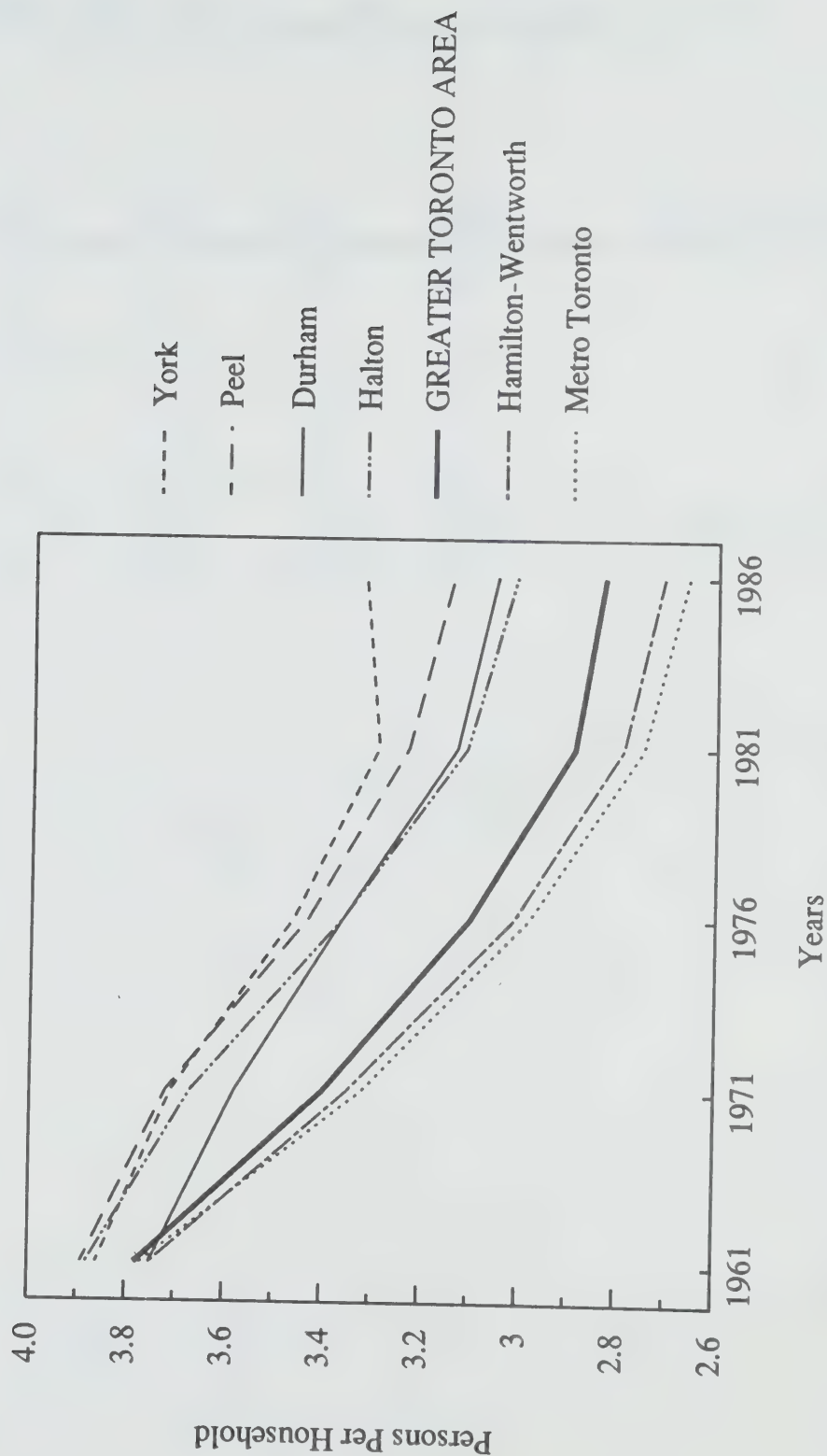
The average household size has declined significantly in the GTA from 3.8 in 1961 to 2.8 in 1986 (Figure 2). In 1961 household size ranged between 3.7 and 3.9 persons per household in the Regions, while by 1986 this dropped to between 2.6 and 3.4 persons per household. The areas that have been historically more

**Table 1/ Number of Households, 1961-1986**

| <b>Households in 000's</b> | <b>1961</b> | <b>1971</b> | <b>1976</b> | <b>1981</b> | <b>1986</b> |
|----------------------------|-------------|-------------|-------------|-------------|-------------|
| Durham                     | 40.6        | 59.9        | 73.7        | 90.5        | 106.9       |
| York                       | 29.6        | 44.8        | 58.9        | 76.7        | 105.5       |
| Metro Toronto              | 430.1       | 629.7       | 713.0       | 776.4       | 822.9       |
| Peel                       | 28.7        | 69.8        | 109.6       | 151.8       | 188.6       |
| Halton                     | 27.6        | 51.8        | 68.1        | 81.6        | 90.1        |
| Hamilton-Wentworth         | 95.8        | 119.7       | 136.1       | 147.2       | 156.3       |
| Greater Toronto Area       | 652.4       | 975.7       | 1,159.4     | 1,324.2     | 1,470.3     |

Source: Statistics Canada, Census of Canada, 1961-1986

Figure 2/ Household Size, 1961-1986



Source: Statistics Canada, Census of Canada, 1961-1986



urban, Metro Toronto and Hamilton-Wentworth, have the smallest average household size.

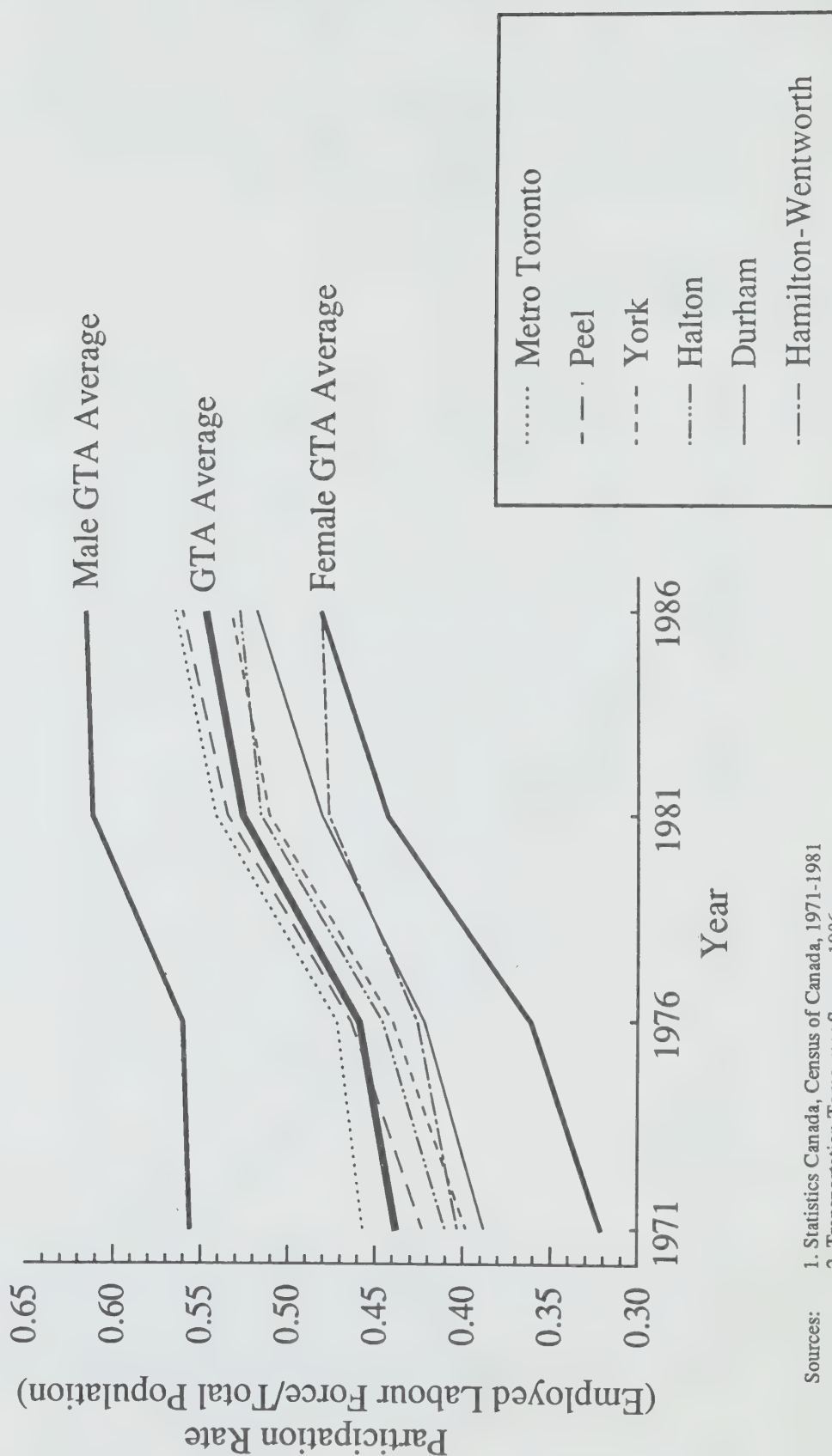
### **3.3 LABOUR FORCE**

An increase in labour force participation has taken place in all Regions for both males and females between 1971 and 1986. Figure 3 shows the substantial increase in the female participation rate (proportion of population that is working) over the 15 year period. In 1971 the female participation was slightly more than half that of males. By 1986 it had risen to 77 percent of the male participation level despite the fact that the male rate had also increased by over 10 percent. An additional factor accounting for the general increase in the participation rate has been the increasing proportion of the population in the working age bracket (from 16 to 65 years of age.)

### **3.4 AUTOMOBILES**

Over the last five years the average annual growth in passenger vehicle population in the Greater Toronto Area has been about 8.7 percent according to Ministry

**Figure 3/ Participation Rate, 1971-1986**



Sources:  
 1. Statistics Canada, Census of Canada, 1971-1981  
 2. Transportation Tomorrow Survey, 1986

of Transportation records of automobile ownership. While the number of persons per household has decreased, the number of automobiles per household has increased as shown in Table 2. The average number of automobiles available in a household in the Greater Toronto Area has risen from 0.9 in 1964 to 1.4 in 1986.

This increase in the availability of private automobiles to members of a household, is one factor contributing to the high growth of trip-making within the GTA. The nature of these trips is described in the next chapter.

**Table 2/ Household Automobile Ownership/  
Availability (Autos per Household), 1964-1986**

|                      | 1964 | 1971 | 1979 | 1980 | 1986* |
|----------------------|------|------|------|------|-------|
| Durham               | 1.1  | 1.2  | 1.4  | ---  | 1.7   |
| York                 | ---  | 1.3  | 1.76 | ---  | 1.9   |
| Metro Toronto        | 0.9  | ---  | 1.0  | 1.1  | 1.2   |
| Peel                 | ---  | ---  | ---  | 1.4  | 1.7   |
| Halton               | ---  | ---  | ---  | 1.5  | 1.8   |
| Hamilton-Wentworth   | ---  | ---  | ---  | 1.1  | 1.4   |
| Greater Toronto Area | 0.9  | ---  | ---  | ---  | 1.4   |

\* 1986 Values shown are available autos, excluding company vehicles for work use only and autos which are not operational

--- Data Not Available

Sources: 1. Travel Surveys from Municipalities, 1964-1980  
2. Transportation Tomorrow Survey, 1986

## 4.0 PERSONAL TRAVEL CHARACTERISTICS

### 4.1 TRIP PATTERNS BETWEEN AND WITHIN REGIONS

The daily total person trip flows, (from a Region of origin to a Region of destination), obtained from the Transportation Tomorrow Survey can be expressed in a trip table form as shown in Table 3. The dominance of Metro Toronto as a hub of trip-making can be seen. Sixty percent of the 8.5 million trips recorded have Metro Toronto as either origin, the destination, or both. The total number of trips generated by residences in the GTA is 8.7 million trips per day when trips to and from the area outside the GTA are included. This 8.7 million trips in 1986 represents an average growth rate of 3.9% per year over the 3.7 million workday trips recorded by MTARTS in 1964.

A mapping of the travel flows between Regions is sketched in Figure 4. Inter-regional travel makes up only 17 percent of the total person trips in the GTA. The influence of Metro Toronto and its central area is immediately apparent. Of those trips generated by York



# Table 3/ 1986 Daily Total Person Trip Distribution

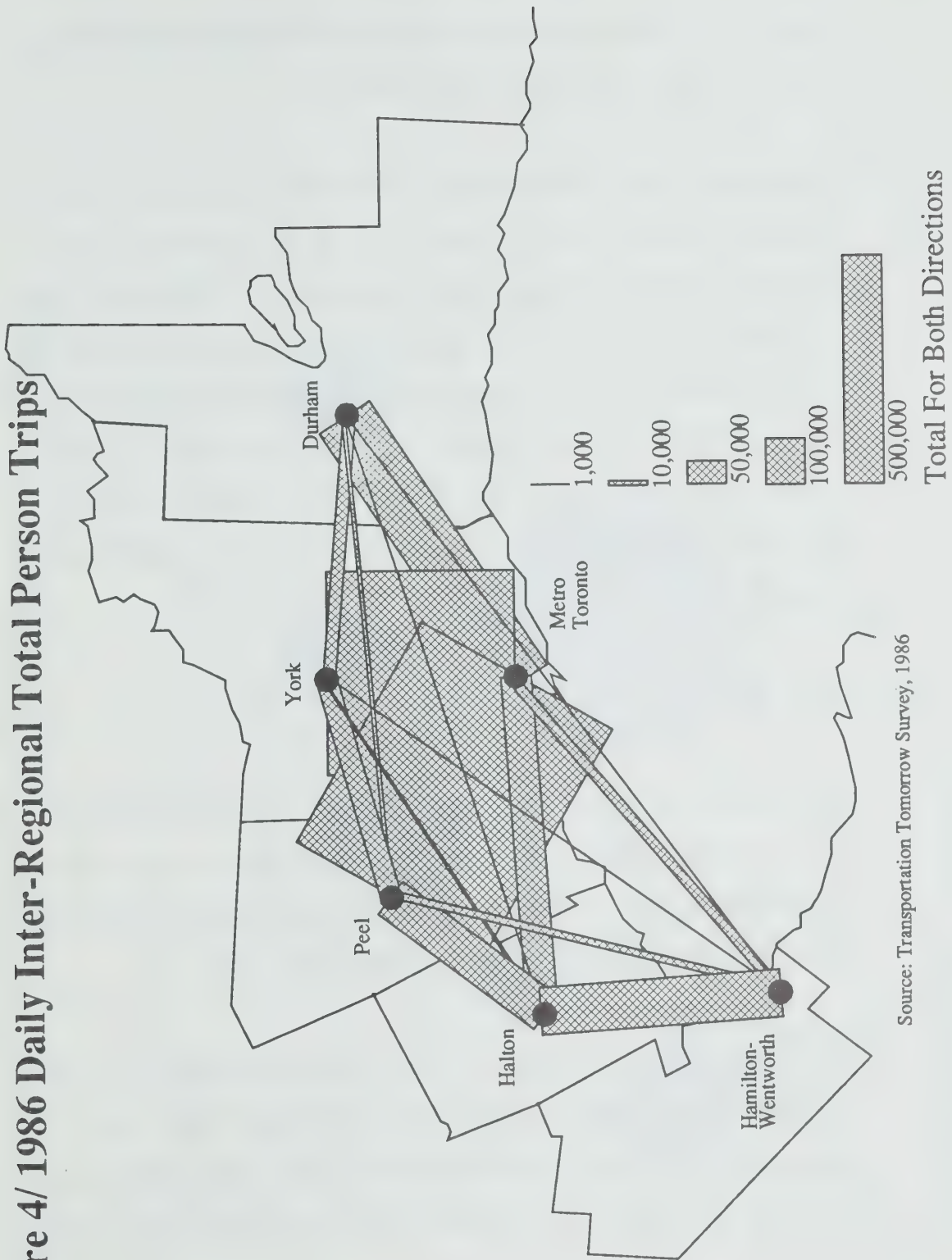
(in thousands of trips)

| Region of Origin          | Region of Destination |                 |                 |                   |                 |                    | Total              |
|---------------------------|-----------------------|-----------------|-----------------|-------------------|-----------------|--------------------|--------------------|
|                           | Metro Toronto         | Durham          | York            | Peel              | Halton          | Hamilton-Wentworth |                    |
| <b>Metro Toronto</b>      | 3920.5<br>(87.3)      | 65.0<br>(1.4)   | 222.7<br>(5.0)  | 237.1<br>(5.3)    | 33.4<br>(0.7)   | 10.6<br>(0.2)      | 4,489.3<br>(100.0) |
| <b>Durham</b>             | 65.5<br>(10.1)        | 565.8<br>(87.0) | 13.9<br>(2.1)   | 3.7<br>(0.6)      | 0.7<br>(0.1)    | 0.6<br>(0.1)       | 650.2<br>(100.0)   |
| <b>York</b>               | 223.0<br>(31.6)       | 14.0<br>(2.0)   | 441.9<br>(62.7) | 22.5<br>(3.2)     | 2.5<br>(0.4)    | 0.9<br>(0.1)       | 704.8<br>(100.0)   |
| <b>Peel</b>               | 237.6<br>(20.1)       | 3.8<br>(0.3)    | 23.0<br>(1.9)   | 864.7<br>(73.2)   | 45.1<br>(3.8)   | 7.6<br>(0.6)       | 1,181.8<br>(100.0) |
| <b>Halton</b>             | 33.8<br>(5.7)         | 0.5<br>(0.1)    | 2.5<br>(0.4)    | 45.0<br>(0.8)     | 463.9<br>(77.7) | 51.4<br>(8.6)      | 597.1<br>(100.0)   |
| <b>Hamilton-Wentworth</b> | 10.8<br>(1.2)         | 0.4<br>(0.0)    | 1.0<br>(0.1)    | 7.5<br>(0.8)      | 51.4<br>(5.8)   | 815.0<br>(92.0)    | 886.1<br>(100.0)   |
| <b>Total</b>              | 4,491.2<br>(52.8)     | 649.5<br>(7.6)  | 705.0<br>(8.3)  | 1,180.5<br>(13.9) | 597.0<br>(7.0)  | 886.1<br>(10.4)    | 8,509.3<br>(100.0) |

(63.0) Percent of Row

Source: Transportation Tomorrow Survey, 1986

**Figure 4/ 1986 Daily Inter-Regional Total Person Trips**



and Peel, Metro Toronto is responsible for attracting 31.6 and 20.1 percent respectively.

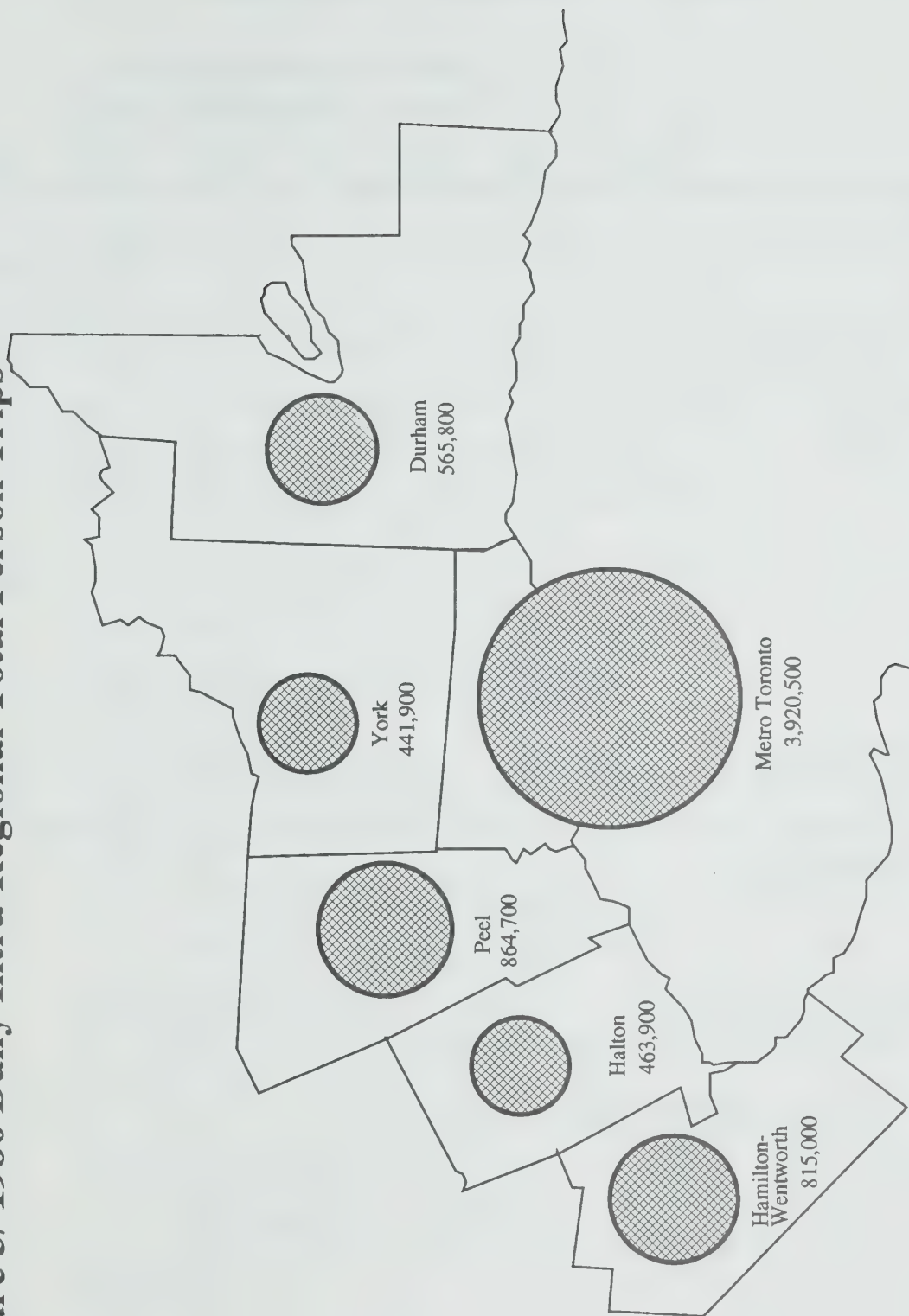
Looking at the trip-making that occurs entirely within Regional boundaries (83 percent of all person trips), Figure 5 gives a comparison by Region. Referring also to Table 3, the highest degree of self-containment of total person trips takes place in Hamilton-Wentworth at 92 percent while the lowest is in York at 62.7 percent. Trips that take place entirely within Metro Toronto account for 46 percent of all trips within the Greater Toronto Area.

#### **4.2 TRIP RATES**

The growth in travel in the Greater Toronto Area has been brought about, in part, by changes in the rate of trip-making by individuals. This trip rate is defined as the number of trips per person per day.

The historical pattern of trip rates is shown in Table 4 based on the results of travel surveys that were undertaken for the Regional Municipalities from 1956 through to 1986. The number of daily trips per person

**Figure 5/ 1986 Daily Intra-Regional Total Person Trips**



Source: Transportation Tomorrow Survey, 1986

# Table 4/ Trip Rates\*, 1956-1986

|                      | Trips Per Person Per Day<br>(Trips Per Household Per Day) |       |       |      |       |       |       |
|----------------------|---|-------|-------|------|-------|-------|-------|
|                      | 1956  | 1964  | 1974  | 1976 | 1977  | 1979  | 1986  |
| Durham               | ---   | 1.4   | ---   | ---  | ---   | 1.6   | 2.3   |
|                      | ---   | (5.3) | ---   | ---  | ---   | (4.9) | (6.2) |
| York                 | ---   | ---   | ---   | ---  | ---   | 2.2   | 2.2   |
|                      | ---   | ---   | ---   | ---  | ---   | (7.3) | (6.7) |
| Metro Toronto        | 1.2   | 1.3   | ---   | ---  | ---   | 2.0   | 2.0   |
|                      | (4.9)   | (4.9) | ---   | ---  | ---   | (5.3) | (4.8) |
| Peel                 | ---   | ---   | ---   | 2.2  | ---   | ---   | 2.2   |
|                      | ---   | ---   | ---   | ---  | ---   | ---   | (6.2) |
| Halton               | ---   | ---   | ---   | ---  | ---   | ---   | 2.5   |
|                      | ---   | ---   | ---   | ---  | (4.6) | ---   | (6.7) |
| Hamilton-Wentworth   | ---   | ---   | 2.0   | ---  | ---   | ---   | 2.2   |
|                      | ---   | ---   | (6.3) | ---  | ---   | ---   | (5.5) |
| Greater Toronto Area | ---   | 1.3   | ---   | ---  | ---   | ---   | 2.1   |
|                      | ---   | (4.9) | ---   | ---  | ---   | ---   | (5.4) |

\* Walking and Bicycle Trips Excluded

NOTE: Extent of under-reporting may be influenced by survey methodology

Source: 1. Travel Surveys from Municipalities, 1956-1979

2. Transportation Tomorrow Survey, 1986, (persons under 6 excluded)



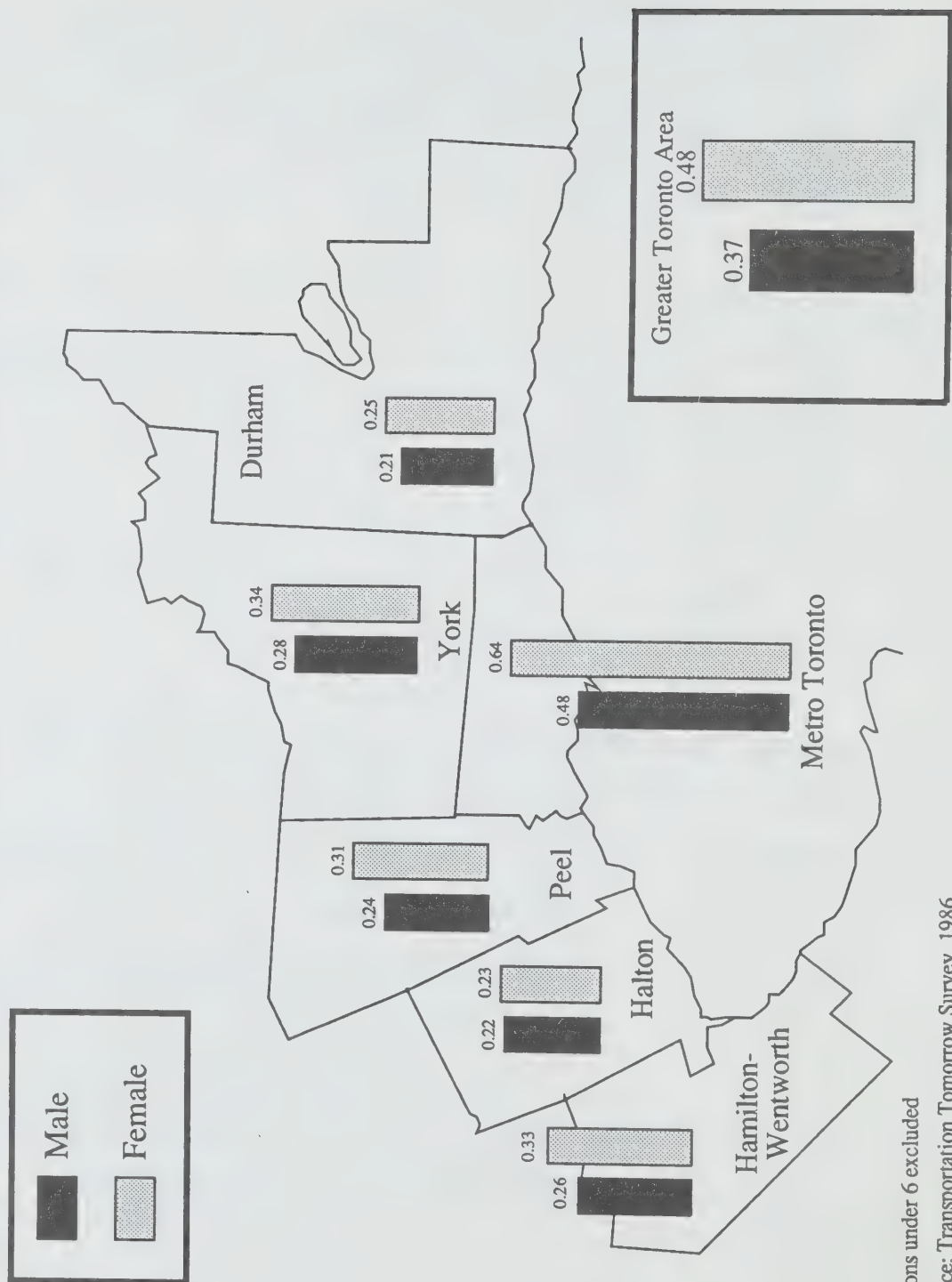
and per household are recorded for all purposes. Walking and bicycle trips have been excluded from the data. The 1986 Transportation Tomorrow Survey did not record trips by persons under six years of age.

When making a historical comparison of trip rates for various Regions and years, it must be recognized that each travel survey had its own unique survey methodology and assumptions. Some degree of under-reporting is likely to exist in all surveys - in the TTS, some under-reporting appears to have occurred for non-work trips and off-peak trips.

Transit trip rates within the Greater Toronto Area indicate that females make 30 percent more use of transit than males (Figure 6). Much higher transit trip rates occur in Metro Toronto due to the more extensive and higher frequency of transit service that is offered.

Auto driver trip rates as shown in Figure 7 indicate that males drive 59 percent more frequently than females.

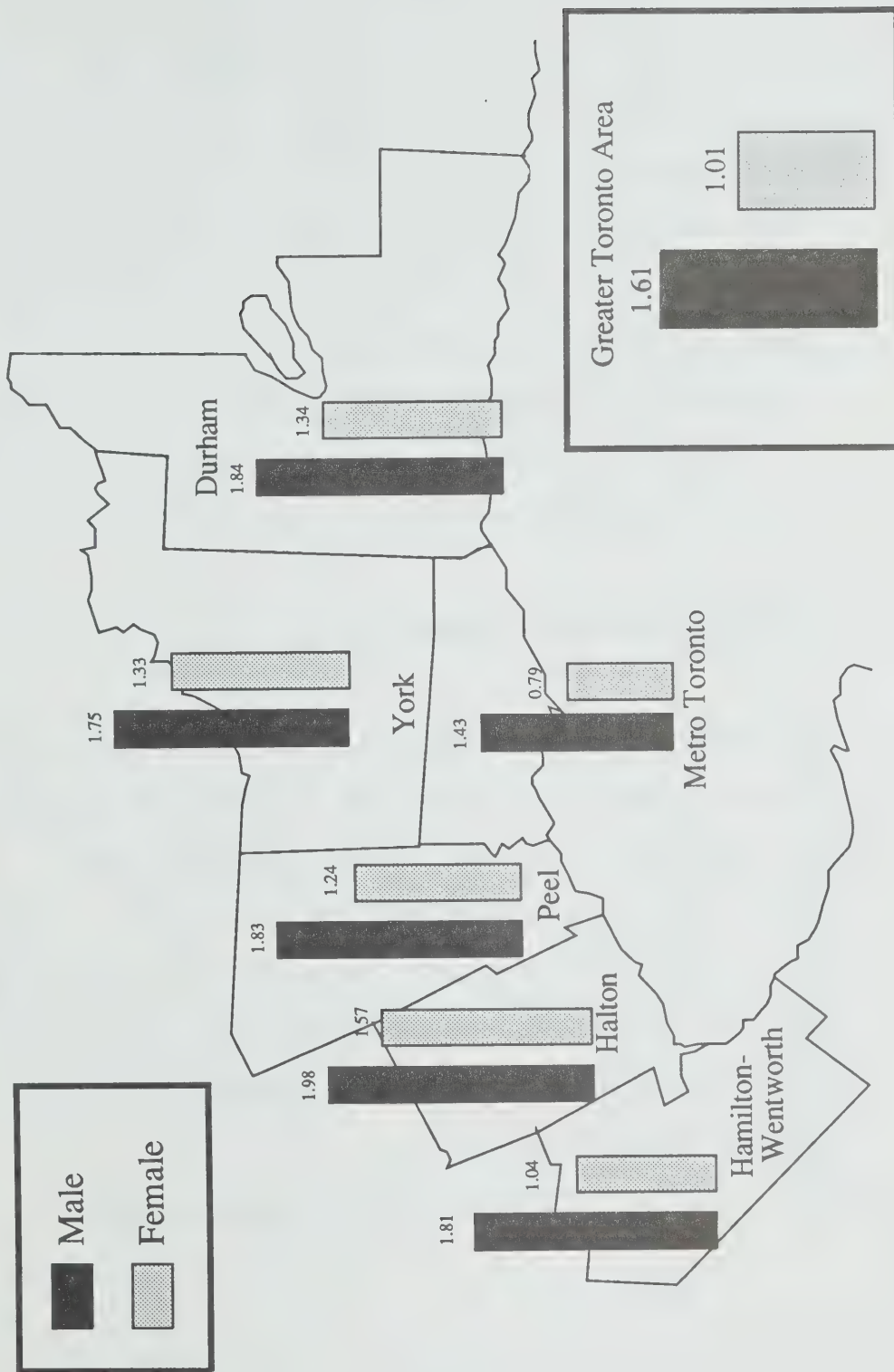
**Figure 6/ 1986 Daily Transit Trips Per Person By Sex and Region**



Persons under 6 excluded

Source: Transportation Tomorrow Survey, 1986

**Figure 7/ 1986 Daily Auto Driver Trips Per Person by Sex and Region**



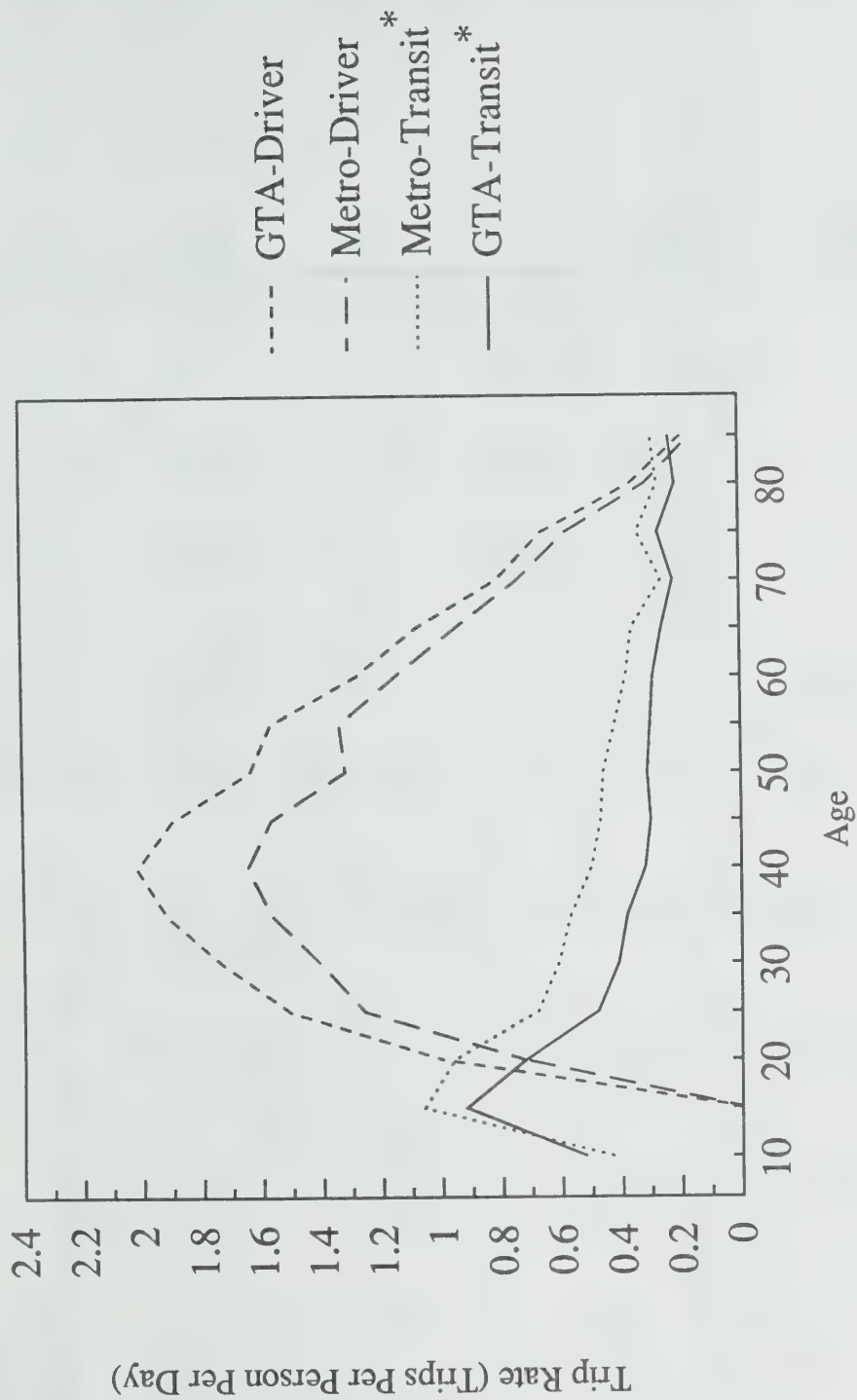
Persons under 6 excluded  
Source: Transportation Tomorrow Survey, 1986

The rate of trip-making by transit users and by auto drivers varies by the age of the individual as can be seen in Figure 8. The rate of transit usage peaks at about age 16 and then declines. It should be noted that school bus trips have been incorporated into the transit rate in this display. Auto driver trip rates peak at about age 40 and then fall off rapidly as age increases. Residents of Metro Toronto have higher transit trip rates and lower auto driver trip rates on average than residents of the Greater Toronto Area.

#### **4.3 TRANSIT RIDERSHIP TRENDS**

In order to give an appreciation of trends in public transit usage within the GTA, historical ridership data is presented in Tables 5 and 6 for the transit properties in the area and for GO Transit. The average growth in total transit ridership in the GTA from 1981 to 1986 is 2.1 percent per year. GO rail ridership experienced an average annual growth rate of 5 percent during the same period.

**Figure 8/ 1986 Transit and Auto Driver Trip Rates by Age  
in Metro Toronto and the Greater Toronto Area**



\* Transit Includes School Bus Trips

Source: Transportation Tomorrow Survey, 1986



# Table 5/ Annual Public Transit Ridership, 1977-1986

| Ridership in 000's   | 1977    | 1979    | 1981    | 1983    | 1985    | 1986    |
|----------------------|---------|---------|---------|---------|---------|---------|
| Durham               | 4,163*  | 3,800** | 4,096   | 4,459   | 4,881   | 4,977   |
| York                 | 1,936   | 2,323   | 3,070   | 3,256   | 3,864   | 4,266   |
| Metro Toronto        | 348,700 | 346,200 | 395,700 | 407,300 | 432,160 | 441,000 |
| Peel                 | 11,219  | 13,240  | 16,515  | 17,107  | 18,488  | 19,318  |
| Halton               | 4,283   | 4,423   | 4,805   | 4,585   | 4,775   | 4,849   |
| Hamilton-Wentworth   | 27,434  | 28,696  | 29,292  | 25,675  | 29,323  | 29,264  |
| Greater Toronto Area | 397,735 | 398,682 | 453,481 | 462,382 | 493,491 | 503,674 |

Notes: Ridership is shown for transit properties operating in the geographic area  
GO Riders not Included

- \* Ridership in Whitby not included
- \*\* Ridership in Whitby and Ajax not included

Source: Ontario Urban Transit Fact Book, 1977-1986

**Table 6/ GO Rail Daily Ridership to Union Station, 1975-1986**

| GO Rail Stations<br>Located in the Region | 1975         | May<br>1979  | Oct.<br>1979 | Sep.<br>1980 | Sep.<br>1981 | Nov.<br>1982 | Nov.<br>1983 | Nov.<br>1984  | Nov.<br>1985  | Nov.<br>1986  |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| Durham<br>% of GTA                        | 1769<br>12.0 | 3715<br>17.7 | 3821<br>17.1 | 4394<br>18.2 | 4538<br>17.3 | 4790<br>16.5 | 5172<br>17.2 | 5497<br>17.4  | 5787<br>17.5  | 5625<br>16.8  |
| York<br>% of GTA                          | 0<br>0.0     | 451<br>2.1   | 491<br>2.2   | 460<br>1.9   | 514<br>2.0   | 1148<br>4.0  | 1181<br>4.0  | 1256<br>4.0   | 1516<br>4.6   | 1538<br>4.6   |
| Metro Toronto<br>% of GTA                 | 5214<br>36.2 | 6372<br>30.4 | 6939<br>31.1 | 6842<br>28.3 | 7086<br>27.1 | 7344<br>25.3 | 7312<br>24.3 | 7790<br>24.6  | 7856<br>23.8  | 8124<br>24.3  |
| Peel<br>% of GTA                          | 5065<br>35.2 | 6284<br>30.0 | 6623<br>29.7 | 7231<br>29.9 | 8055<br>30.8 | 9358<br>32.2 | 9872<br>32.9 | 10463<br>33.0 | 10893<br>33.0 | 11072<br>33.1 |
| Halton<br>% of GTA                        | 2316<br>16.1 | 4077<br>19.4 | 4293<br>19.2 | 5132<br>21.2 | 5838<br>22.3 | 6220<br>21.4 | 6344<br>21.1 | 6542<br>20.7  | 6790<br>20.6  | 6951<br>20.8  |
| Hamilton-Wentworth<br>% of GTA            | 37<br>0.3    | 78<br>0.4    | 167<br>0.7   | 131<br>0.5   | 154<br>0.6   | 197<br>0.7   | 149<br>0.5   | 172<br>0.5    | 148<br>0.4    | 168<br>0.5    |
| Greater Toronto Area                      | 14401        | 20977        | 22334        | 24190        | 26185        | 29057        | 30030        | 31660         | 32990         | 33478         |

Note -Figures are calculated by adding total number of passengers boarding GO Rail daily at all GO stations within each region, excluding Union Station

Source: GO Rail Cordon Counts, 1975-1986

#### 4.4 MARKET SHARES BY MODE

The modal shares of total person trips and home to work trips on a regional basis for 1986 as compared with earlier years are given in Tables 7 and 8. The Greater Toronto Area global figures are presented for 1964 and 1986. Most noticeable is a decline in the percentage of trips by auto passengers by 5.7 percent, reflecting reduced auto occupancies, and an increase in the use of other modes of travel (walk and bicycle) by 4.4 percent. The transit share of total person trips in the GTA has increased marginally to 18.4 percent.

Figures 9 and 10 show the 1986 market shares by mode for total person trips and home-based work trips respectively. Metro Toronto exhibits the highest share of use of public transit facilities and the lowest share of automobile driver trips for both total person trips and home based work trips. In Metro Toronto, the use of transit for home based work trips is higher than it is for trips of all purposes combined. In other Regions, a large proportion of transit trips are for school purposes. The strength of work-oriented transit use in the Greater Toronto Area results in a daily

# Table 7/ Modal Shares of Total Person Trips

| Place of Residence   | Auto            |           |                 |      | Transit         |      | Walk and Bicycle |
|----------------------|-----------------|-----------|-----------------|------|-----------------|------|------------------|
|                      | Driver          | Passenger | Auto Total      |      | Previous Survey | 1986 |                  |
| Place of Residence   | Previous Survey | 1986      | Previous Survey | 1986 | Previous Survey | 1986 | 1986             |
| Durham               | 68.2            | 63.8      | 21.3            | 18.3 | 89.5            | 82.1 | 8.6              |
| York                 | 64.3            | 64.0      | 20.2            | 16.1 | 84.5            | 80.1 | 6.9              |
| Metro Toronto        | 53.0            | 50.8      | 15.4            | 14.4 | 68.4            | 65.2 | 9.1              |
| Peel                 | ---             | 62.4      | ---             | 16.6 | ---             | 79.0 | 9.5              |
| Halton               | 61.7            | 66.3      | 17.0            | 17.3 | 78.7            | 83.6 | 8.0              |
| Hamilton-Wentworth   | 59.6            | 59.0      | 20.3            | 18.9 | 79.9            | 77.9 | 9.9              |
| Greater Toronto Area | 56.2            | 56.8      | 21.6            | 15.9 | 77.8            | 72.7 | 8.9              |

Notes: Durham, York, Metro Toronto and Halton figures are for 1979 and 1986  
 Hamilton-Wentworth figures are for 1974 and 1986  
 Greater Toronto Area figures are for 1964 and 1986

--- Data not available

Sources 1. Travel Surveys from Municipalities, 1964-1979  
 2. Transportation Tomorrow Survey, 1986

# Table 8/ Modal Shares of Home to Work Trips

|                      | Auto            |           |                 | Transit |                 | Walk and Bicycle |                 |      |     |     |
|----------------------|-----------------|-----------|-----------------|---------|-----------------|------------------|-----------------|------|-----|-----|
|                      | Driver          | Passenger | Auto Total      |         |                 |                  |                 |      |     |     |
| Place of Residence   | Previous Survey | 1986      | Previous Survey | 1986    | Previous Survey | 1986             | Previous Survey | 1986 |     |     |
| Durham               | 83.0            | 76.9      | 10.4            | 11.8    | 93.4            | 88.7             | 3.7             | 7.0  | 4.3 |     |
| York                 | 77.8            | 78.2      | 9.6             | 9.1     | 87.4            | 87.3             | 9.1             | 10.1 | 2.6 |     |
| Metro Toronto        | 54.0            | 53.2      | 9.1             | 8.5     | 63.1            | 61.7             | 31.3            | 32.9 | 5.4 |     |
| Peel                 | ---             | 74.9      | ---             | 10.6    | ---             | 85.5             | 7.0*            | 11.7 | 2.8 |     |
| Halton               | 81.4            | 80.2      | 7.4             | 9.2     | 88.8            | 89.4             | 6.6             | 7.6  | 3.0 |     |
| Hamilton-Wentworth   | ---             | 70.9      | ---             | 11.3    | ---             | 82.2             | ---             | 11.2 | 6.6 |     |
| Greater Toronto Area | 57.5            | 63.5      | 12.8            | 9.4     | 70.3            | 72.9             | 22.5            | 22.5 | 6.8 | 4.6 |

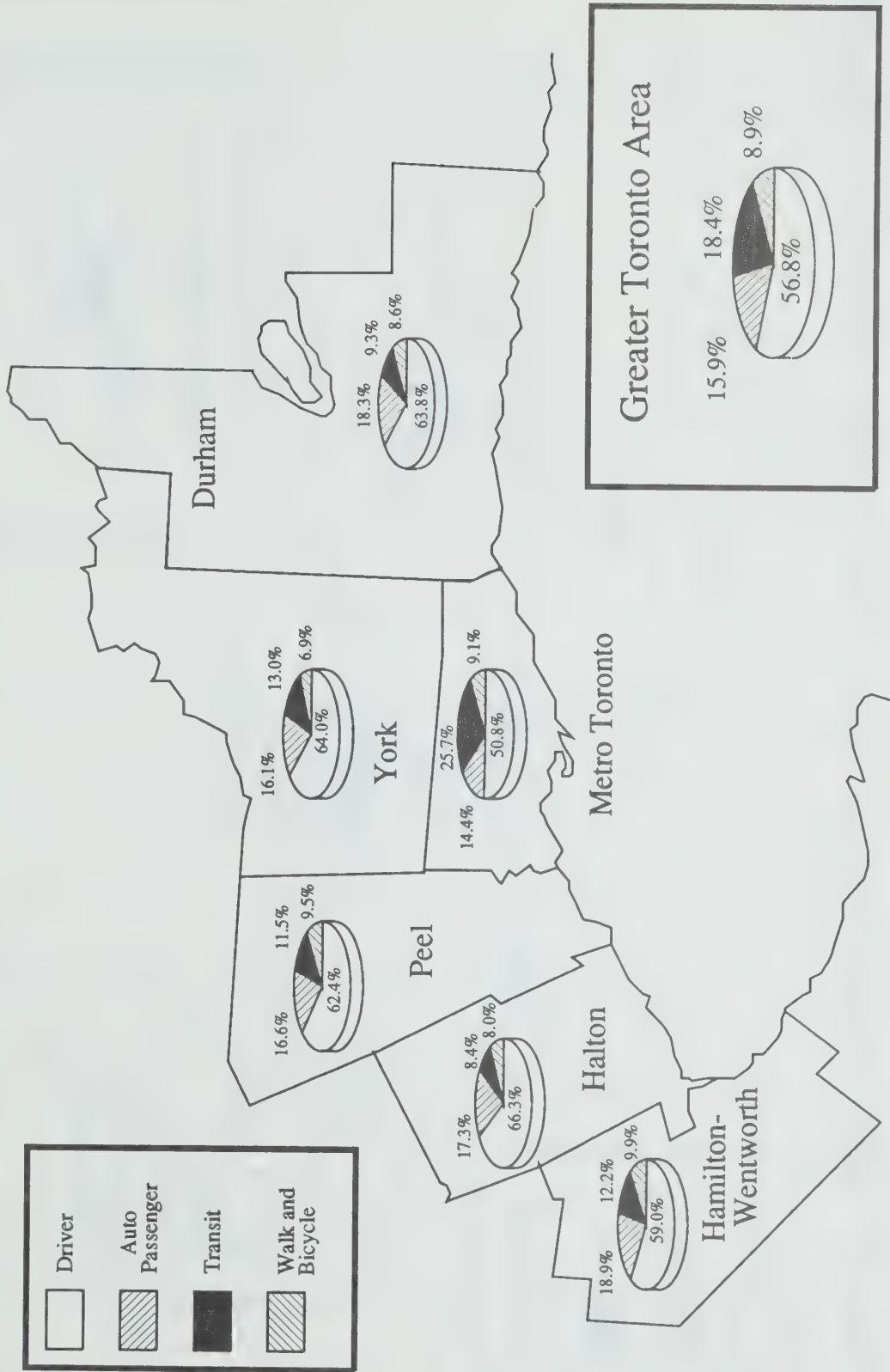
Notes: Durham, York, Metro Toronto and Halton figures are for 1979 and 1986  
 Hamilton-Wentworth figures are for 1974 and 1986  
 Greater Toronto Area figures are for 1964 and 1986  
 \* Estimated

--- Data not available

Sources 1. Travel Surveys from Municipalities, 1964-1979  
 2. Transportation Tomorrow Survey, 1986

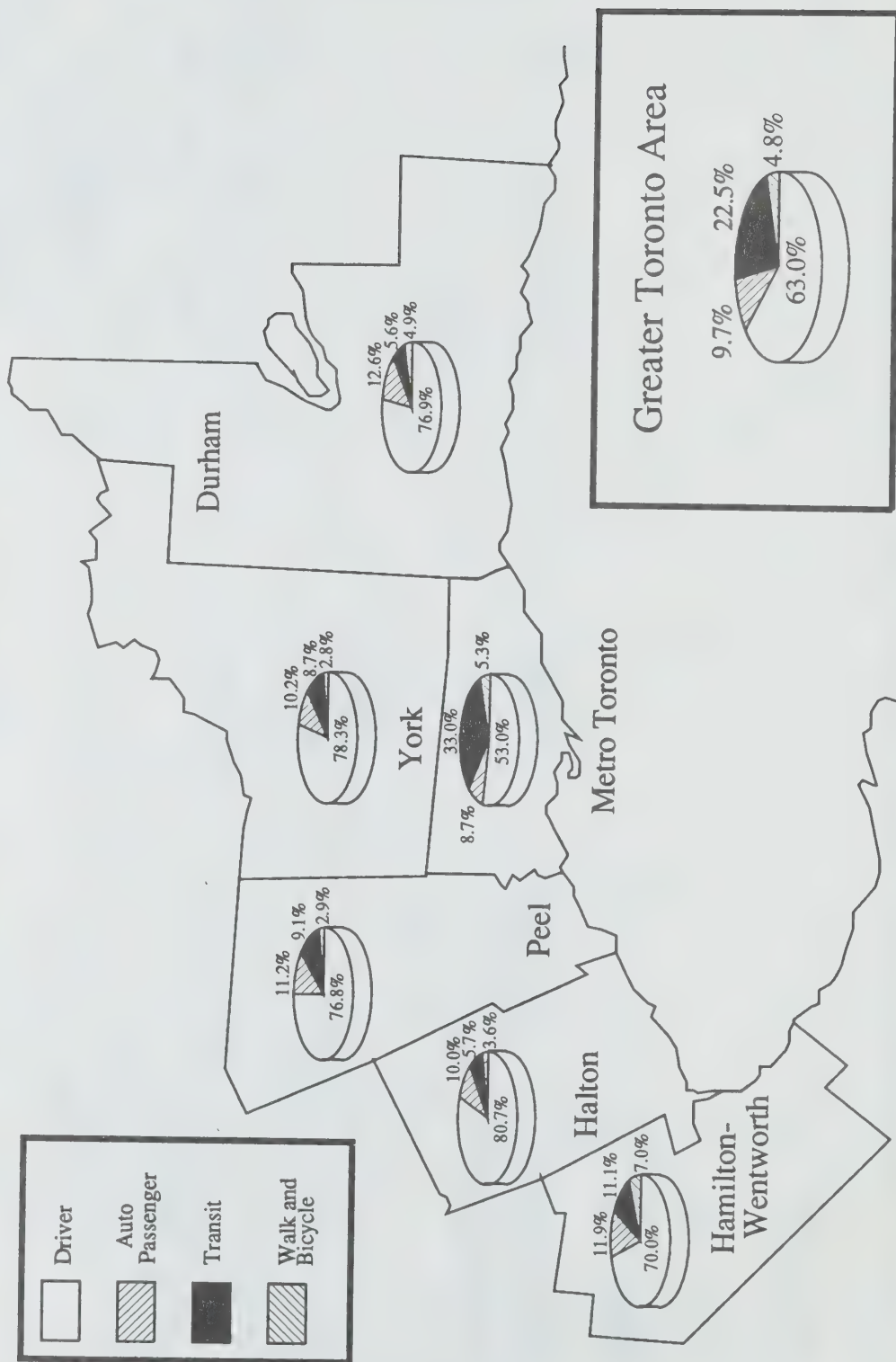


**Figure 9/ Modal Shares of Total Person Trips for Each Region, 1986**



Source: Transportation Tomorrow Survey, 1986

Figure 10/ Modal Shares of Home Based Work Trips by Region of Origin, 1986



Source: Transportation Tomorrow Survey, 1986

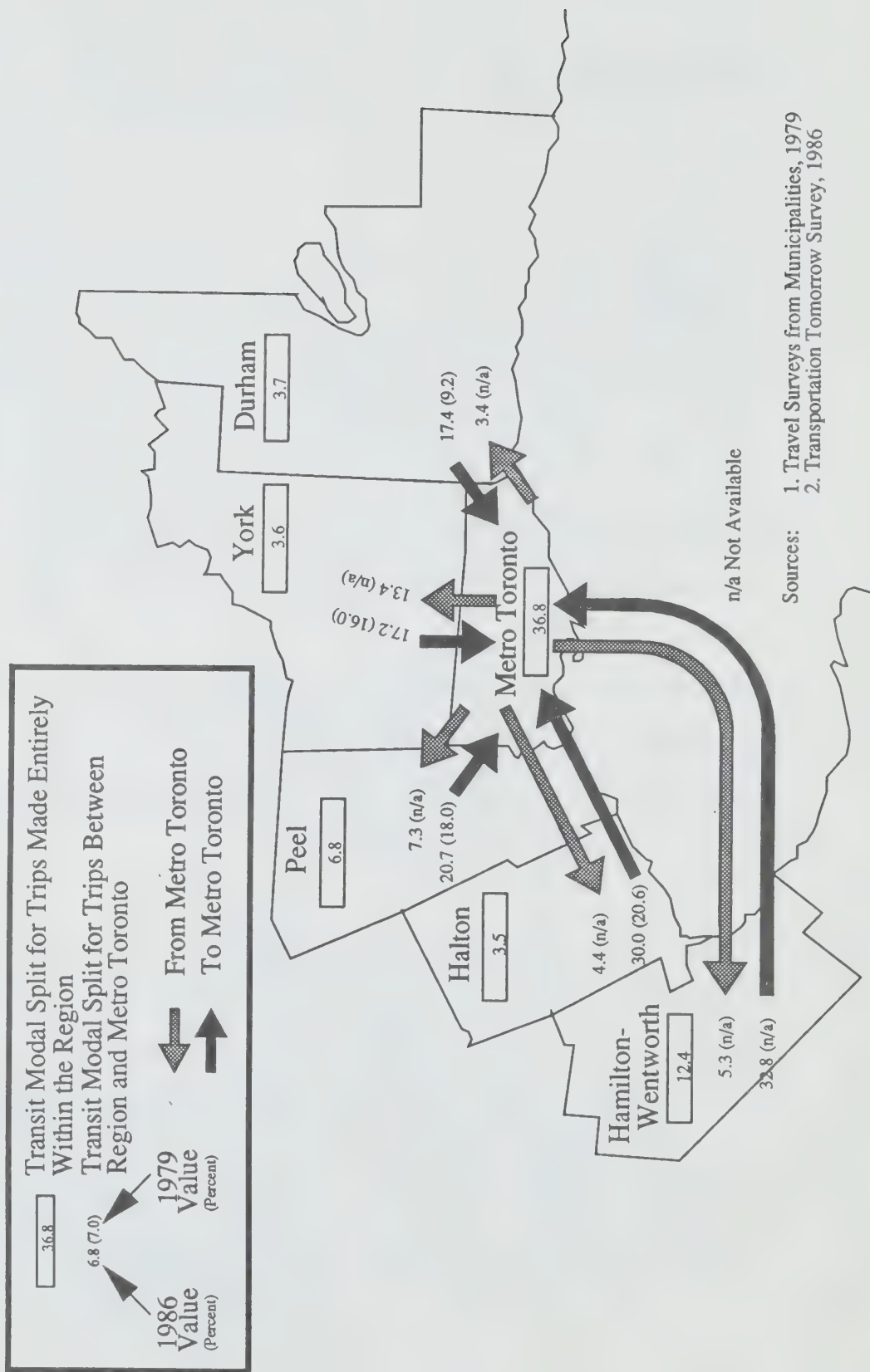
transit modal split of 22.5 percent for home to work trips as compared with 18.4 percent for all trips combined.

Transit modal splits for home to work trips taking place within each Region, and between each Region and Metro Toronto are illustrated in Figure 11. 1986 and 1979 values are shown where available, but modal splits under three percent are not indicated. Once again, Metro Toronto and Hamilton-Wentworth exhibit the highest level of transit use for internal trips.

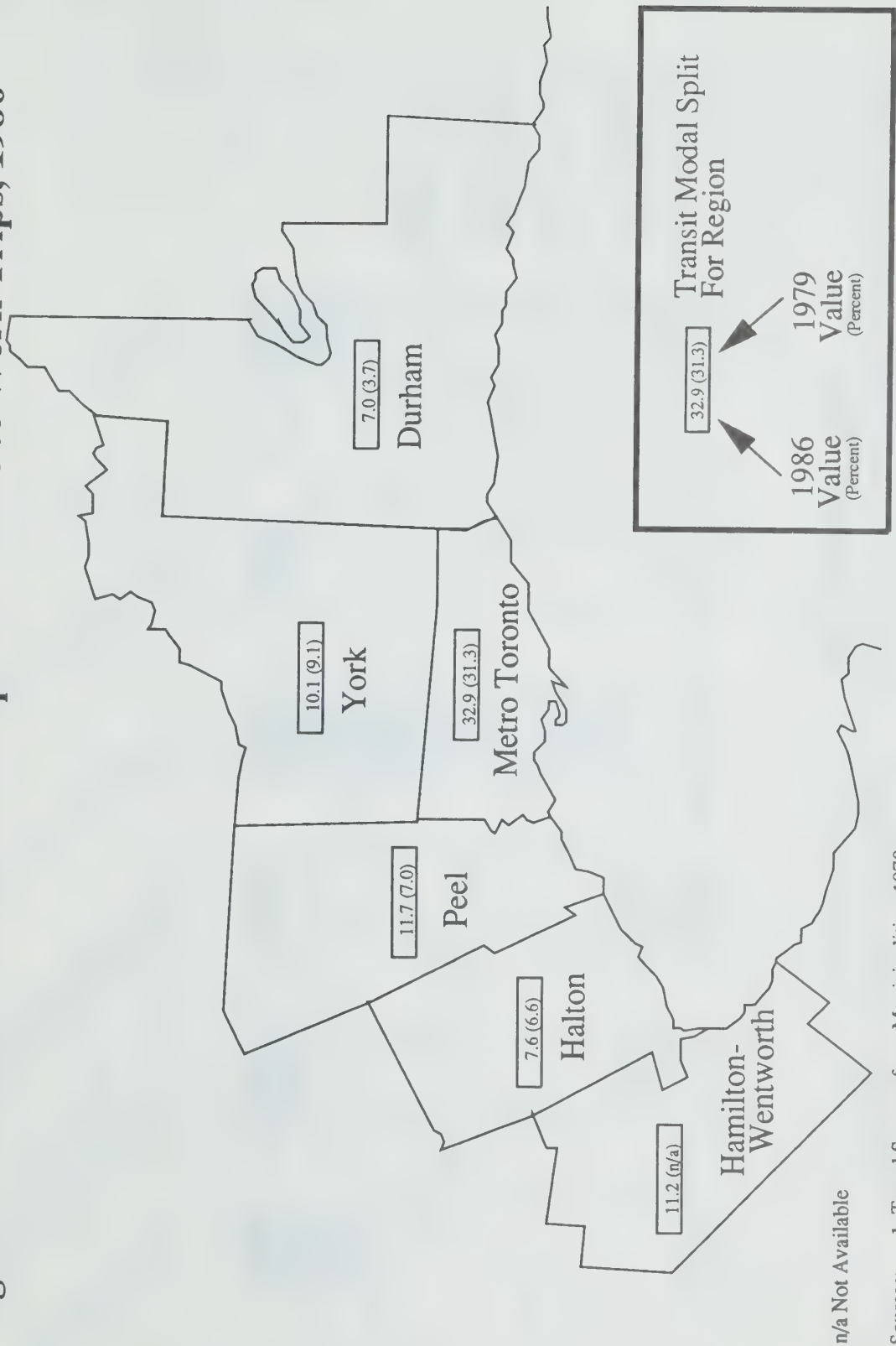
The overall transit market share for home to work trips is shown in Figure 12. There has been a general increase in the transit modal share for home to work trips over the seven year period.

Modal shares of total person trips in the Greater Toronto Area by trip purpose for 1986 are illustrated in Figure 13. Five categories of trip purposes that can be drawn from the Transportation Tomorrow Survey are home-based work, home-based shop or personal business, home-based social, recreational and other, home-based school and non home-based. A home-

**Figure 11/ Transit Modal Split for Home to Work Trips, 1986  
(Within Regions and With Metro Toronto)**

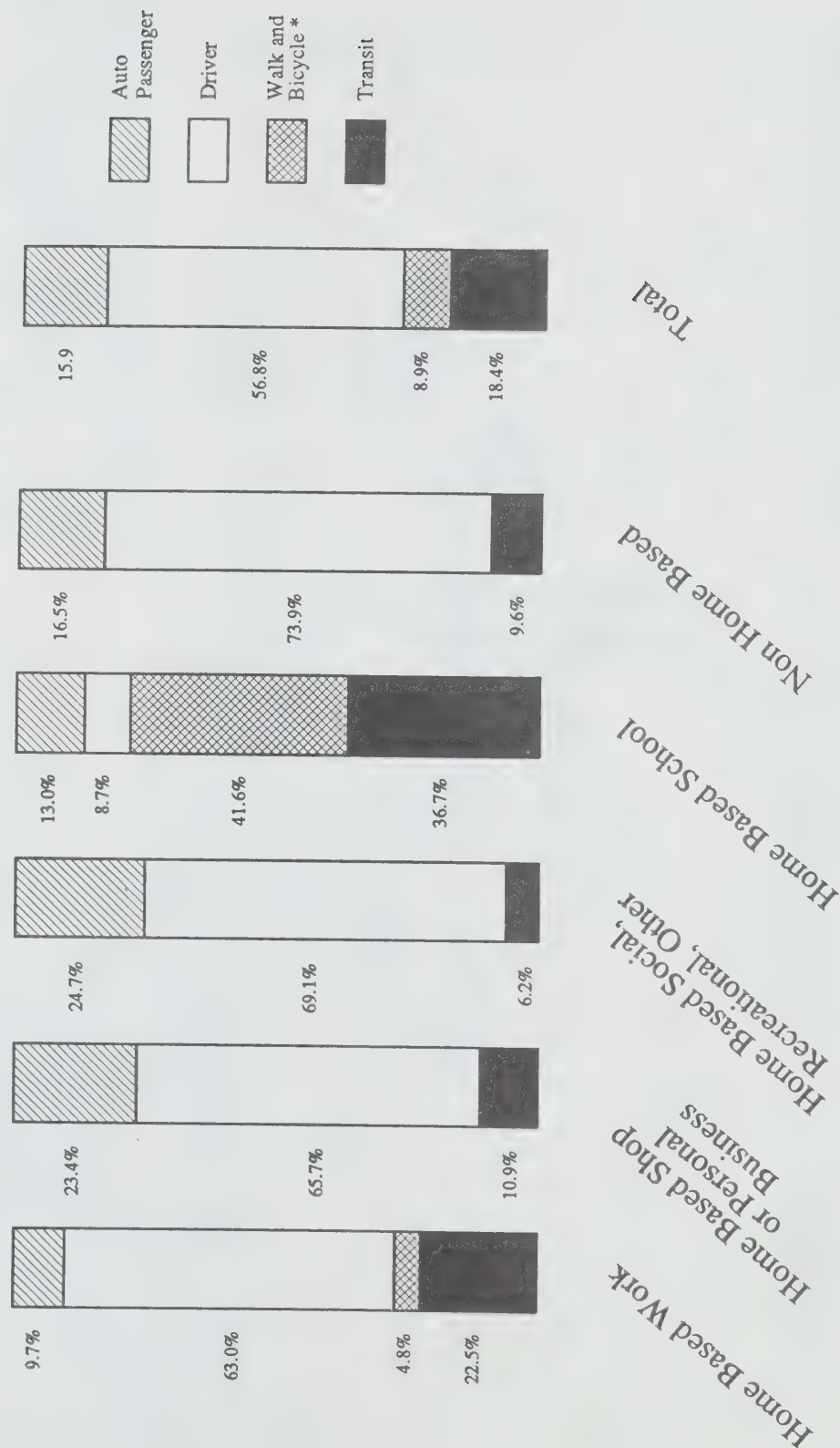


**Figure 12/ Overall Transit Modal Split for Home to Work Trips, 1986**



Sources: 1. Travel Surveys from Municipalities, 1979  
2. Transportation Tomorrow Survey, 1986

**Figure 13/ Modal Shares of Total Person Trips in the Greater Toronto Area By Trip Purpose, 1986**



\* Walk trips were recorded only for Home Based Work and Home Based School trips

Source: Transportation Tomorrow Survey, 1986



based trip is one which either starts or finishes at home, with the purpose defined by the activity at the other end.

Walking trips were recorded in the Transportation Tomorrow Survey only for work-related or school-related trips. Figure 13 indicates that the choice of mode for a trip is highly dependent on the particular trip purpose. The likelihood of selecting transit is much higher for home-based school and work trips than it is for each of the other home-based or non home-based trips.

#### **4.5 TRIP PURPOSE**

The historical percentage of trips for each category of trip purpose broken down on a Regional level is shown in Table 9. Values are given, where available, for the years 1956, 1964, 1979 and 1986. Hamilton-Wentworth data was from the year 1974 instead of 1979. It should be noted that in 1964 the proportion of home-based school trips may be under-stated because the survey was conducted late in the spring.

**Table 9/ Percentage of Trips By Purpose  
for Each Region, 1956-1986**

| Place of<br>Residence | Home Based Work |      |             |         | Home Based School |           |            |         | Home Based Shop |      |             |         | Home Based Social |      |             |         | Non Home Based |      |             |         |
|-----------------------|-----------------|------|-------------|---------|-------------------|-----------|------------|---------|-----------------|------|-------------|---------|-------------------|------|-------------|---------|----------------|------|-------------|---------|
|                       | 56              | 64   | 79          | 86<br>* | 56                | 64        | 79         | 86<br>* | 56              | 64   | 79          | 86<br>* | 56                | 64   | 79          | 86<br>* | 56             | 64   | 79          | 86<br>* |
| Durham                | ---             | 44.0 | 39.6        | 33.6    | ---               | 4.0<br>** | 9.9        | 10.6    | ---             | 23.1 | 21.8        | 21.8    | ---               | 17.8 | 19.4        | 17.1    | ---            | 11.1 | 9.3         | 86<br>* |
| York                  | ---             | ---  | 32.4        | 36.1    | ---               | ---       | 14.8       | 13.8    | ---             | ---  | 15.0        | 18.2    | ---               | ---  | 13.3        | 16.4    | ---            | ---  | 12.9        | 15.6    |
| Metro Toronto         | 51.0            | 49.0 | 44.0        | 41.7    | ---               | ---       | 8.0        | 10.6    | 25.0            | 27.0 | 17.4        | 17.8    | 12.0              | 13.0 | 17.9        | 14.8    | 11.0           | 11.0 | 12.9        | 15.2    |
| Peel                  | ---             | ---  | ---         | 39.2    | ---               | ---       | ---        | 11.2    | ---             | ---  | ---         | 18.3    | ---               | ---  | ---         | 15.5    | ---            | ---  | ---         | 15.7    |
| Halton                | ---             | ---  | ---         | 32.6    | ---               | ---       | ---        | 10.4    | ---             | ---  | ---         | 19.7    | ---               | ---  | ---         | 19.7    | ---            | ---  | ---         | 17.8    |
| Hamilton-Wentworth    | ---             | ---  | 32.4<br>*** | 31.9    | ---               | ---       | 9.9<br>*** | 9.7     | ---             | ---  | 19.5<br>*** | 21.1    | ---               | ---  | 14.0<br>*** | 19.7    | ---            | ---  | 16.5<br>*** | 17.6    |
| Greater Toronto Area  | ---             | 43.0 | ---         | 38.4    | ---               | 4.0<br>** | ---        | 10.8    | ---             | 23.0 | ---         | 18.8    | ---               | 18.0 | ---         | 16.1    | ---            | 11.0 | ---         | 15.9    |

Notes:

- \* Home Based School Walk Trips Excluded
- \*\* School trips may be under-reported due to summer survey
- \*\*\* 1974 value used

Source: 1. Travel Surveys from Municipalities, 1956-1979  
2. Transportation Tomorrow Survey, 1986

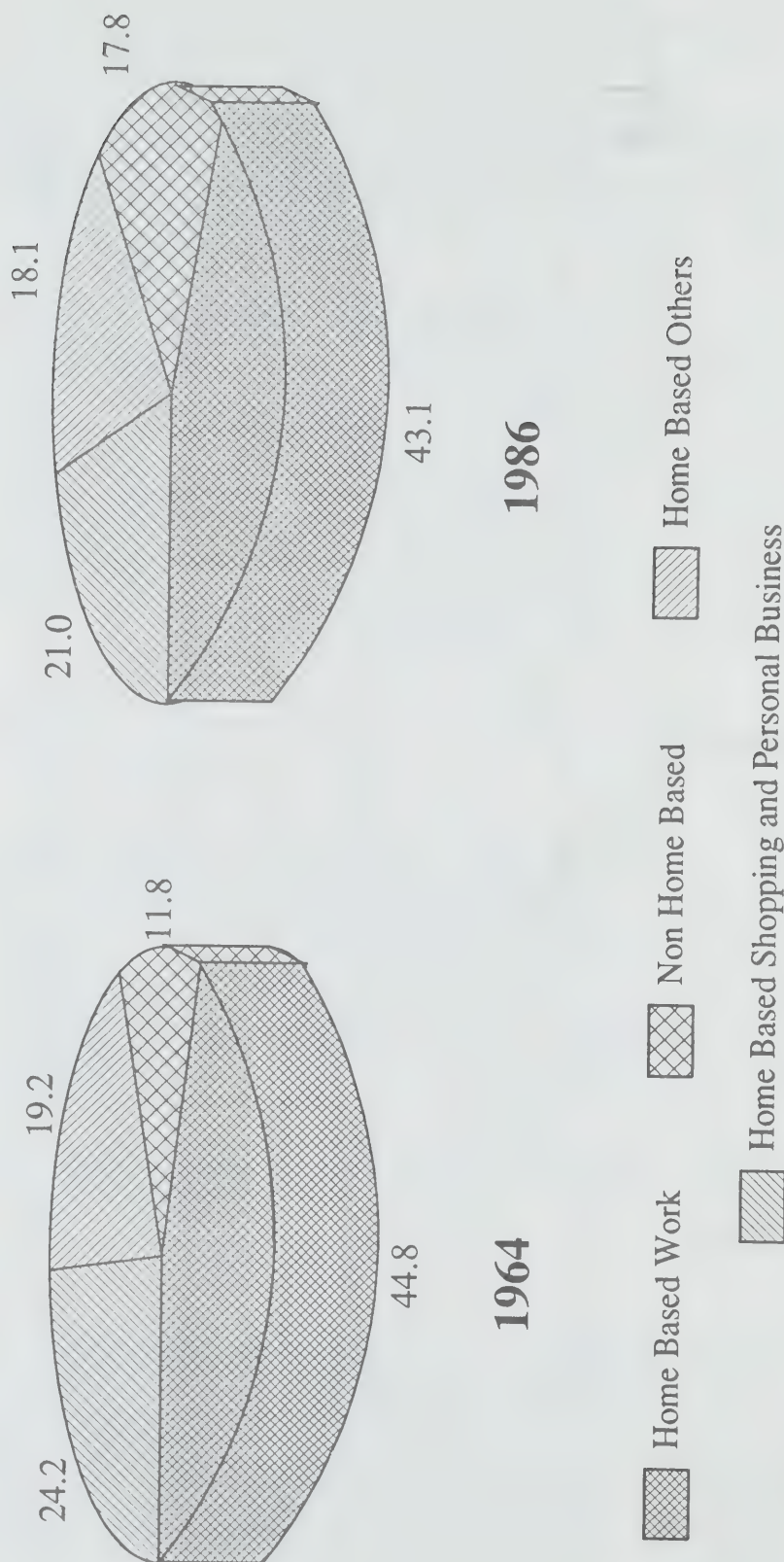
A comparison of results for the Greater Toronto Area in years 1964 and 1986 is illustrated in Figure 14. Home-based school trips have been excluded to make the comparison more equitable. Although the validity of comparisons could be affected by differences in the 1964 and 1986 methodologies, the results indicate an increase in the share of non home-based trips. This effect is strong enough to reduce the proportion of even the home-based work trips.

#### **4.6 WORK TRIPS**

The pattern of work trips is determined by the locations of the residences of workers and the locations of their work places. In Regions where the employed labour force exceeds the Regional employment a net outflow of home to work trips will result. In Regions where the opposite is true, there will be a net inflow.

Figure 15 shows for each Region the number of residents who are employed and the number of jobs in that Region. Both Metro Toronto and Hamilton-Wentworth have more jobs than labour force, while the remaining Regions have an excess of labour force over jobs.

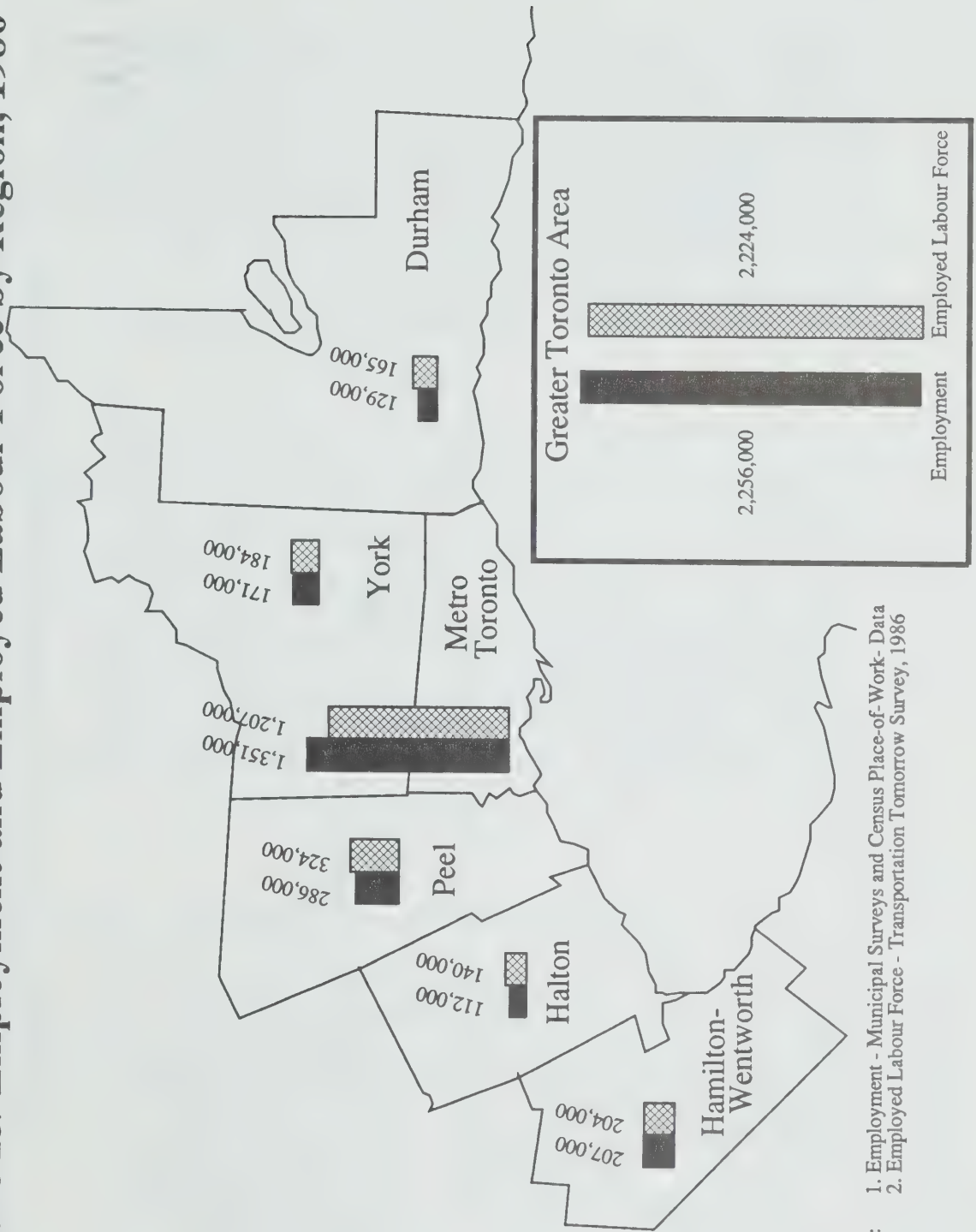
**Figure 14/ Comparison of Proportion of Total Person Trips  
in the Greater Toronto Area by Purpose (1964, 1986)**



**Note: Home Based School Trips Have Been Excluded**

Sources: 1. Transportation Tomorrow Survey, 1986  
2. Metropolitan Toronto and Region Transportation Study, 1964

**Figure 15/ Employment and Employed Labour Force by Region, 1986**



Sources: 1. Employment - Municipal Surveys and Census Place-of-Work-Data  
2. Employed Labour Force - Transportation Tomorrow Survey, 1986



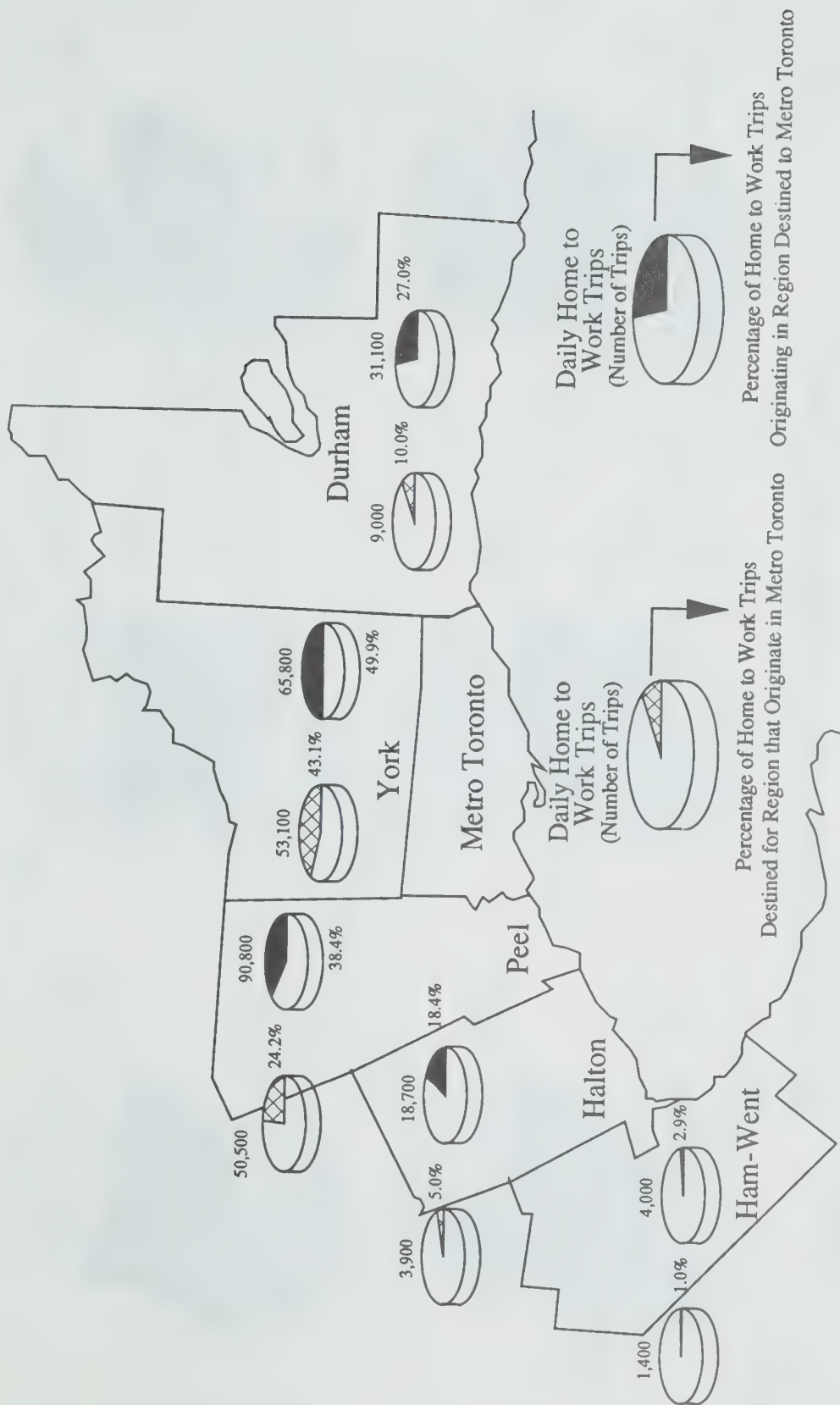
The Transportation Tomorrow Survey gives a clear indication of the number of cross boundary work trips and where they go. Figure 16 shows the number of home to work trips by Regional residents which proceed daily to Metro Toronto and the number of trips made by Metro Toronto residents in the reverse direction.

Considering, now, the destinations of all work trips generated by each Region, Figure 17 illustrates the destination share, including the work trips that stay within each Region. The black proportion of each chart is a measure of the degree of self-containment of each Region. The highest self-containment is shown for the Regions having a more mature urban area: Metro Toronto, Hamilton-Wentworth and Durham.

Taking the viewpoint from the employment end, Figure 18 shows the origin of the work trips going into each Region. The interaction with both Metro Toronto and adjacent municipalities (e.g. Peel and York) is apparent.

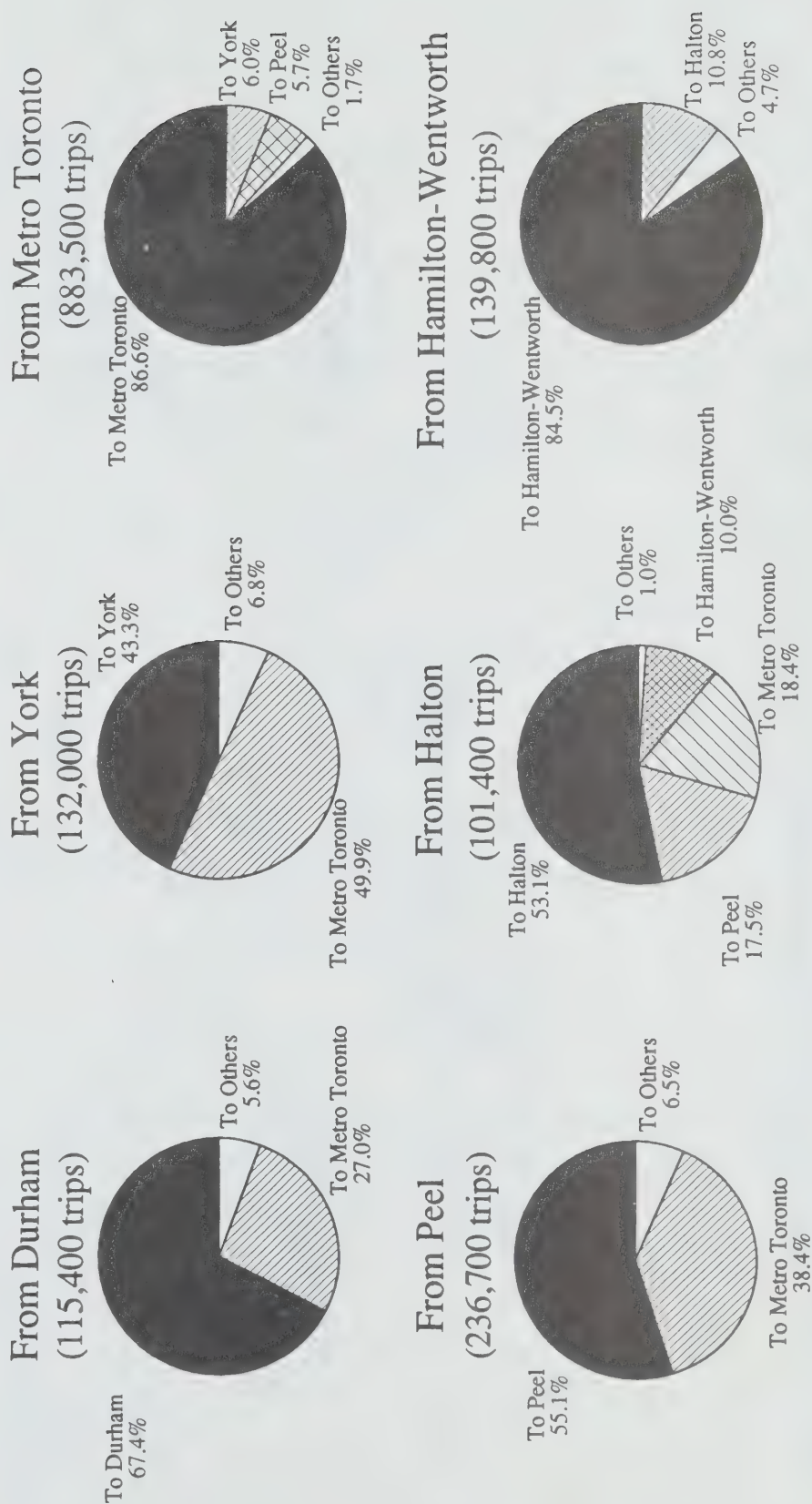


**Figure 16/ Proportion of 1986 Home to Work Trips that Originate in or are Destined to Metro Toronto by Region**



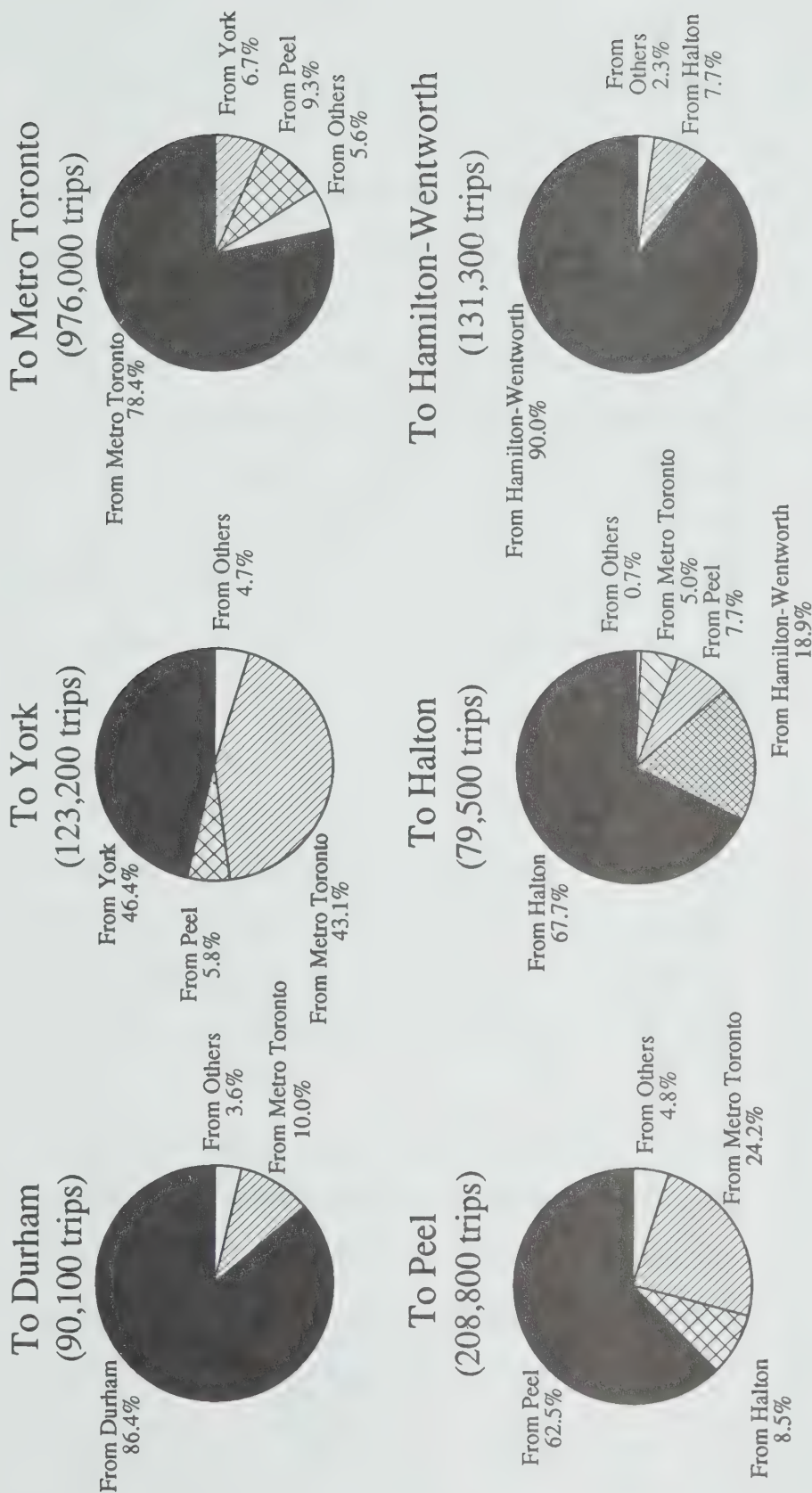
Source: Transportation Tomorrow Survey, 1986

**Figure 17/ Percentage of Home to Work Trips  
From Each Region To Each Region, 1986**



Source: Transportation Tomorrow Survey, 1986

# Figure 18/ Percentage of Home to Work Trips To Each Region From Each Region, 1986



Source: Transportation Tomorrow Survey, 1986

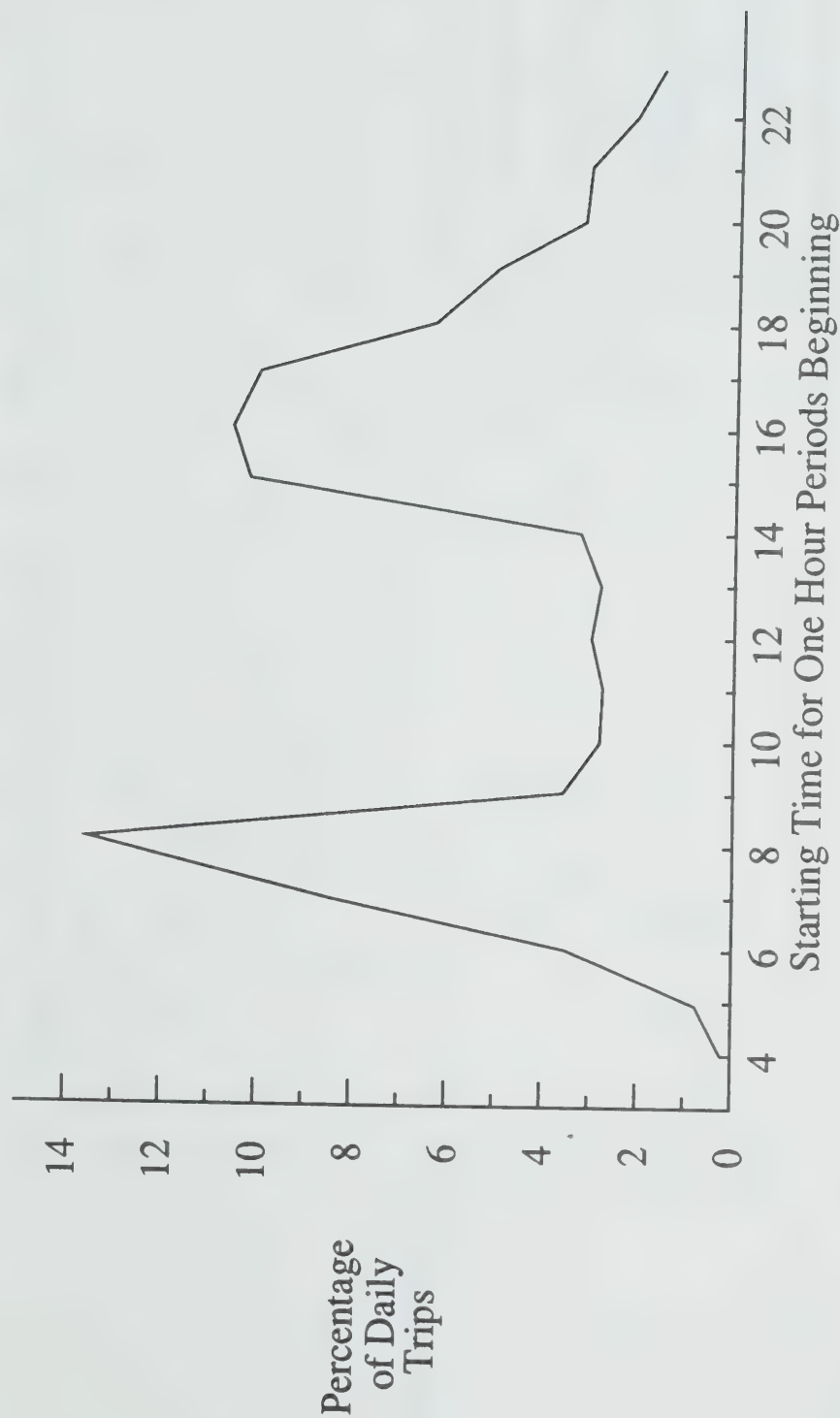
#### 4.7 START TIME DISTRIBUTION

The start time distribution for trips within Metro Toronto in 1986 is shown as an hourly percentage of the daily total trips in Figure 19. The resulting peaking characteristics are based on rounding the trip start time back to the nearest preceding hour. Walk and bicycle trips have been excluded. It should be noted when interpreting this figure, that only trip start times are shown and the figure does not display the actual duration of the morning and afternoon rush hour periods.

A comparison with data from earlier surveys indicates that the start time distribution has changed very little over the past 30 years. Due to differences in the way data was collected in earlier surveys it is difficult to draw firm conclusions in this area.

The trip start time distribution for home-based work, home-based shop or personal business, home-based social, recreational and other, and non home-based trips is displayed in Figure 20. The time distribution includes trips by residents of the Greater Toronto

**Figure 19/ Total Person Trip Start Time Distribution  
in Metro Toronto\*, 1986**

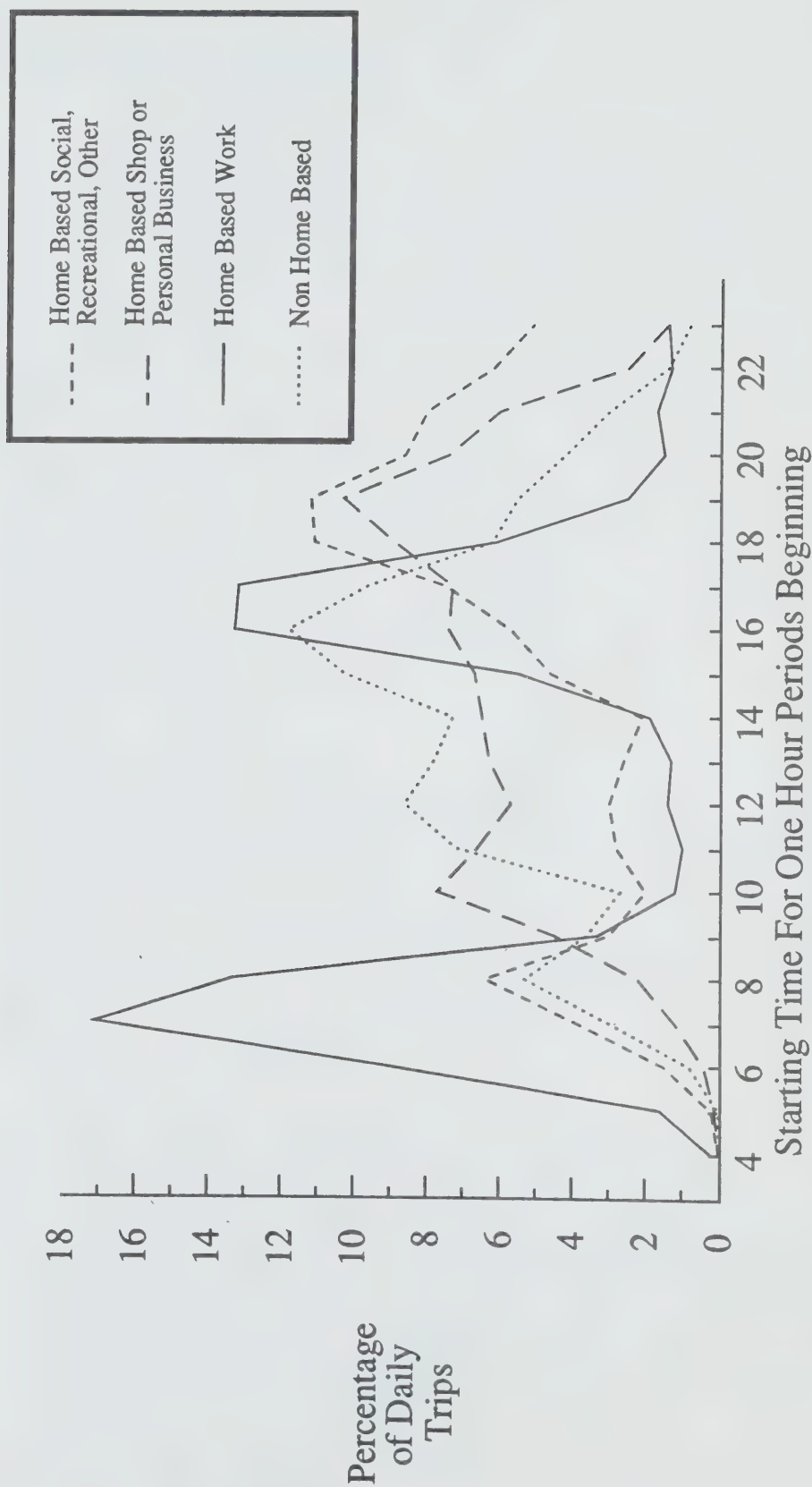


\* Metro Toronto Residents Excluding Walk and Bicycle Modes

Source: Transportation Tomorrow Survey, 1986



**Figure 20/ Total Person Trip Start\* Time Distribution  
by Trip Purpose , 1986**



\* Greater Toronto Area Residents

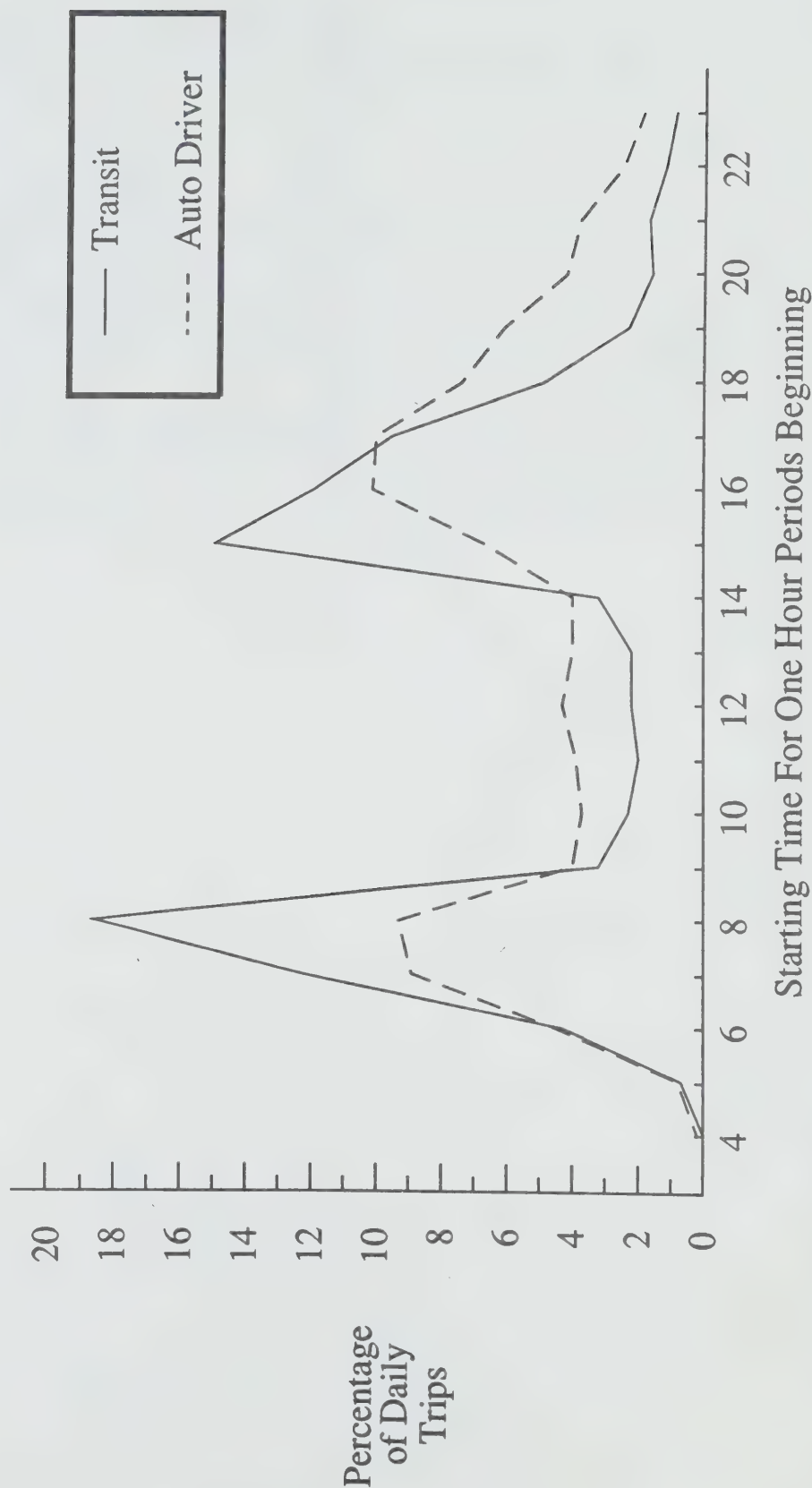
Source: Transportation Tomorrow Survey, 1986



Area. The strongest peaking is exhibited for work trips.

The trip start time distributions for auto driver and transit trips are graphed in Figure 21 to illustrate the relative peaking characteristics of the two modes. Clearly, transit trip-making has a greater peak during the rush hours than does auto driver travel, and the peak is more pronounced in the morning period.

**Figure 21/ Total Person Trip Start Time Distribution  
For Auto Driver and Transit\*, 1986**



\* Greater Toronto Area Residents

Source: Transportation Tomorrow Survey, 1986

## APPENDIX

### DESCRIPTION OF THE DATA COLLECTED BY THE TRANSPORTATION TOMORROW SURVEY

The Transportation Tomorrow Survey was a telephone-based interview survey that contacted individuals residing at selected households (a 4.1% sample) in the GTA (complete details are recorded in TTS Report #1, Design and Conduct of the Survey" - December, 1987). These representatives of the household were asked to report on the trips made by all persons in the household during a pre-specified weekday.

Information has been recorded at 3 levels: the household, persons living in the household, and all trips made by those persons.

An outline of the key items of data collected is as follows:

1. Household
  - a) Location
  - b) Type of dwelling unit - house or apartment
  - c) Number of motor vehicles available to the household  
for personal use
  - d) Number of persons normally living at the household

## 2. Persons

For each member of the household:

- a) Age
- b) Sex
- c) Possession of driver's license (yes/no)
- d) Employment Status (full or part time)  
(work at home or elsewhere)
- e) Student Status

## 3. Trips

For each member of the household who was 6 years of age or older, each trip made was recorded over a 24 hour period beginning at 4:00 am:

- a) Origin Location
  - b) Destination Location
- } address, monument name (e.g. CN Tower), or a specific intersection corner
- c) Start Time
  - d) Purpose of Trip (work, school, market/shop, personal business, entertainment/social/recreational, facilitate passenger, return home, or other)
  - e) Mode(s) Used
    - walk
    - automobile (drive or passenger)
    - taxi
    - bicycle
    - motorcycle
    - transit bus/subway/train
    - school bus
    - other
  - f) For transit trips a record was kept of route number and transit property (e.g. TTC) and the location of major transfer points.

All location information was geocoded.

A complete technical description of the TTS data records and files is contained in TTS Report #3: "Version 2.2 Data Guide".

1. Greater Toronto Area Urban Regional Travel Characteristics, Published by Toronto Area Transportation Planning Data Collection Co-ordinating Committee, Ministry of Transportation and Communications, September 1982
2. GO Rail Corridor Census, 1975-1986, GO Transit
3. Ontario Urban Transit Year Book, 1977-1986, Ministry of Transportation and Communications
4. Statistics Canada, Census of Canada: Population, Households, Household Size, 1986

## REFERENCES

1. Greater Toronto Area Inter-Regional Travel Characteristics, Published by: Toronto Area Transportation Planning Data Collection Co-Ordinating Committee, Ministry of Transportation and Communications, September 1982
2. GO Rail Cordon Counts, 1975-1986, GO Transit
3. Ontario Urban Transit Fact Book, 1977-1986, Ministry of Transportation and Communications
4. Statistics Canada, Census of Canada: Population, Households, Household Size, 1986





